October, 1957 Vol. 46 No. 8

INDUSTRIAL ARTS AND VOCATIONAL EDUCATION

The Shop Teachers' Professional Magazine

SHOP PROJECTS NUMBER

Who built the United States?

The "United States" is the name of the fastest, safest, most luxurious ship ever built on these shores. And the United States is the name of the greatest country in the world. When you ask, "Who built the United States?" it does not matter which is meant. The answer is the same in either case.

The United States was built by men of vision, men of achievement, men of creative genius. But where do men of such talents come from? History has demonstrated talents are not hereditary. Distinguished engineers have almost always come from average homes. As youths they were no different than the lads who crowd our classrooms today.

Creative genius, the spark of achievement, slumbers in every student! Whether or not it is fanned into a flame before the spark smothers, decides the future. Sometime in the formative days of youth there is a turning point . . . when the man of tomorrow clears his thinking, starts training himself in weighing values, learns that discrimination between the good and shoddy which so definitely marks every man who rises to great success.

The selection of the right drawing instruments frequently marks this turning point. For usually these are the first fine possessions ever to come into his hands. They initiate him into the discipline which he must have, the sensitive craftmanship which is the mark of his profession. Chosen with care, his set can give him pride of possession, then pride in work. It can open the world of imagination to him, give him a new vista of creative achievements, stimulate his ambition and lift his ability. The slightly higher cost of *fine* instruments is nothing at all when measured over their years of service and certainly an investment in success which should never be denied.

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SPECIAL INTRODUCTORY OFFER—A sample copy of this new $2.00 South Bend Project Book and a copy of newly revised Edition 54, "How to Run a Lathe", (total value $2.50) will be sent postpaid to any shop instructor or supervisor for only $1.00.

34 PROJECTS TO STIMULATE STUDENT INTEREST

Nail Set	Machinist Clamp	Mercury Plumb Bob
Punches	Bell Punch	Machinist Jack Screw
Plumb Bob	Sleeve Hammer	Cabinet Maker's Vise
C-clamp	Center Punch	Tap Wrench
Lathe Mandrel	Lathe Dog	"T" Tap Wrench
Lathe Centers	Hammer Kit	Water Motor
Drill Pad	Boring Bar	Arbor Press
Crotch Center	Milling Arbor	Hand Power Emery Grinder
Cup Center	Taper Test Plug	Gasoline Engine
Spur Center	Test Socket	
Bolt & Nut	Surface Gauge	
Pipe Center	Bench Vise	
Screw Driver	Jack Screw	

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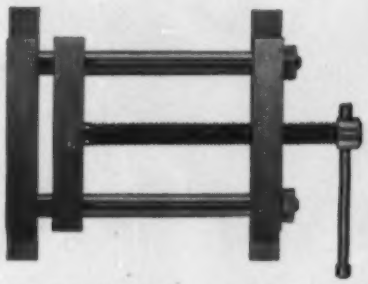
HOW-TO project for the School Shop

—by NICHOLSON FILE COMPANY

NO. 22 OF A SERIES

3" DRILL PRESS VISE



Raw Material Required: 2 pcs. cold rolled steel 1/2" x 1 1/4" x 4 1/8"; 1 pc. cold rolled steel 1/2" x 1" x 3 1/8"; 1 pc. cold rolled steel 3/8" dia. x 18"; 2 1/4-20 nuts; 1 pc. cold rolled steel, 3/16" dia. x 4"; 1 pc. cold rolled steel, 1/4" dia. x 1"; 1 pc. cold rolled steel, 3/4" dia. x 3/4" long; soft solder and paste.

Tools Required: Hacksaw or metal bandsaw, layout dye, scriber, 6" ruler, 6" combination square, 6" adjustable wrench, 3/8"-16 and 1/4"-20 button dies, 3/8"-16 tap, 1/4"-20 tap, center punch, 4-oz. ball peen hammer, small surface gauge, 3/8" machine reamer, 1/4" machine reamer, 5/16" drill, #7 drill, 3/16" drill, 15/64" drill, 23/64" drill, 1" micrometer, 9" metal turning lathe or similar, 2 3" C-clamps, squirt can of lubricating oil, proper ground tool bits for lathe turning, bench vise, drill press, 5" Vernier caliper, Nicholson 8" Pillar X.F. #0 cut file, Nicholson 8" Mill Bastard file.

PROCEDURE

Jaws. 1. Dye the strips of 1/2" C.R.S., lay out dead and anchor jaws. The steps are either hacksawed then filed, or bandsawed. File the steps to the layout line; use Nicholson 8" Pillar X.F. #0 cut for this operation. Remove all burs. The live jaw is a strip of 1/2" x 1" x 3 1/8" C.R.S. Square ends to size, remove burs.

2. The live jaw is selected for the proper layout of holes. Using the surface gauge, stand the block end-over-end to establish a common center line. Two more lines are scribed 1 1/8" from this center line. Place the block on one side and scribe a line 1/2" up through the common center line, and two more through the outer lines, 5/8" up. Where these lines intersect place center punch marks, three in all.

3. Using the C-clamps, place live jaw above the other two; clamp securely with the top of the jaws on a common plane. Drill three 3/16" pilot holes using center punch marks as guides. When completed, separate and hand bur the holes with a larger dia. drill.

4. This step will narrow the jaws to their individual position in the vise assembly. The live jaw outer holes are drilled and reamed 3/8" dia. for a slip fit of tie-rods. Ream center hole 3/8" deep for the lead-screw pivot. Anchor jaw is drilled and reamed 1/4" dia. Dead jaw holes are drilled #7 and tapped 1/4"-20. Center hole of the anchor jaw is tapped 3/8"-16; be sure to keep tap square to face surface at all times.

Tie rods and lead screw. 1. Two tie-rods are required using 3/8" dia. C.R.S. Over-all length is 4 9/16", with both ends turned and threaded as indicated in sketch. Hold shoulder-to-shoulder length to a plus or minus .002" tolerance. This will hold vise jaws parallel.

2. Lead screw is also machined from 3/8" dia. steel rod. Machine the over-all length to 4 3/4" long; chamfer both ends. Using the 3/8"-16 button die in its holder, chuck the rod in the lathe. With the lathe running in back gear, start cutting the thread. To achieve a square start, use the tailstock of the lathe for the initial push. Keep lubricated while cutting. Use the 8" Mill Bastard file and remove burs.

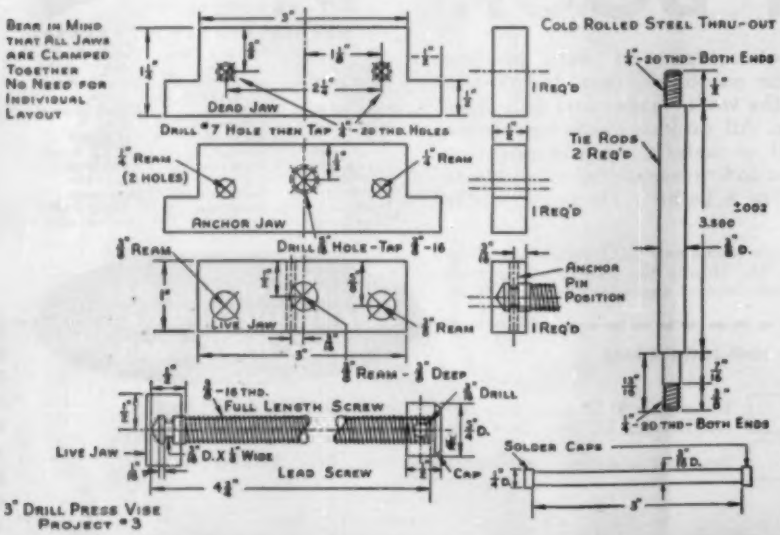
3. Place unthreaded portion of the lead-screw into live jaw; drill the 3/16" keying hole through the block and screw. Remove the screw and place in the lathe. With a round-nose tool, continue the groove around its circumference to the depth left by the 3/16" dia. drill. When keyed in place, the lead screw will spin freely without leaving its socket.

Assembly. 1. Screw the tie-rods into the dead jaw. Place live jaw on rods. Screw lead screw into anchor jaw, then slip this jaw on to the tie-rod ends and fasten with 1/4"-20 hex nuts. Push the live jaw back on to the lead screw, key in place with 3/16" dia. stock.

2. A cap is machined and threaded, then slipped over the exposed lead screw; jam this cap securely in place. Through the cap and lead screw, drill a 3/16" dia. hole for the "T" handle.

3. The "T" handle is a 3" length of 3/16" dia. stock with 1/4" dia. end cap stays soldered in place. Solder the second cap only after the unit is in place.

4. The vise is now complete. Oil all moving parts for ease of operation and long wear. If the vise seems stiff, loosen the tie-rods and shift positions until a slip fit is achieved.



The Nicholson Pillar X.F. #0 cut and the Nicholson Mill Bastard files are shown in sizes reduced from those specified in the text.

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FREE REPRINTS OF THIS PAGE for school shops will be sent to instructors or school heads on request. Ask for "How-to Project No. 22" and state minimum number of copies required. NOTE: These and other Nicholson and Black Diamond files are available at industrial supply houses and hardware stores.

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OCTOBER
1957

VOL. 46 NO. 8

Industrial Arts and Vocational Education

The Shop Teachers' Professional Magazine

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This Month's Cover

The picture on this issue of the INDUSTRIAL ARTS AND VOCATIONAL EDUCATION magazine shows James Gaites, the instructor, explaining Motor-Trol to Richard MacDowell, electric shop student at Middlesex County Vocational and Technical High School, New Brunswick, N. J.

The Motor-Trol is an electronic device for running a d.c. motor on a.c. current at varied speeds.

Photograph submitted by Charles F. Green, school photographer.

☆ ☆ ☆

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Association News

COMING CONVENTIONS

Oct. 4–5. Ohio Vocational Association, at Columbus, Ohio. Secretary, Ralph J. Woodin, 101 Rehearsal Hall, Ohio State University, Columbus 10, Ohio.

Oct. 11. Maryland Vocational Association, at Southern Hotel, Baltimore, Md. Secretary, Austin Gisriel, Kenwood High School, Baltimore, Md.

Oct. 11–12. Four-State Industrial Arts and Vocational Education Association, Pittsburg, Kans. Secretary, J. V. Melton, Kansas State Teachers College, Pittsburg, Kans.

THE 1957 AVA CONVENTION

Philadelphia, Pa., acted as host to the 2900 or more members of the American Vocational Association who held their 51st annual vocational convention in that city. The convention city was kindly disposed toward the visitors who came to attend this important educational meeting. There was little of the extreme heat which everyone was expecting. Of course, as is often the case in large cities the meetings were held at points far apart and much time was spent in traveling from one meeting place to another.

In spite of all this, the meetings were well attended.

The National Association of State Directors of Vocational Education held their first meeting on Friday, August 2, 1957, to discuss basic issues in the further development and improvement of vocational education.

At the evening meeting, practices and policies in the administration of vocational education were discussed, and on Saturday the emerging problem in extending vocational education beyond the high school were the subject of discussion.

A luncheon sponsored by the Automobile Manufacturers Association for state directors and state supervisors of trade and industrial education was held on Wednesday, August 7. The speaker on this occasion was Merle E. St. Aubin of the General Motors Corporation, Detroit, Mich.

The National Council of Local Administrators of Vocational Education and Practical Arts held their first meeting Sunday, August 4, at 7:30 p.m.

George W. Morgenroth, president of this organization, was chairman.

The subjects discussed at the round table were: Current problems and events as they relate to the local director's activities of promoting vocational and practical arts education.

On Monday morning a joint meeting with the National Association of State Supervisors of T. and I. Education, and the American Technical Education was held. The discussion centered around the subject: Trends and patterns in the extension of trade and technical education beyond the high school, in city, county, and state school systems.

At the Monday afternoon session, Lawrence G. Derthick spoke on the administrator's concern for vocational education.

At the Tuesday morning session curriculum planning was discussed on the federal, state, and local level.

Tuesday at noon a luncheon and business meeting was held.

On Thursday afternoon a session was devoted to educational television at which speakers presented the plans for educational television used by the New York State Board of Education, and by the Pittsburgh Board of Education. A telecast of one of a series on vocational careers made by the Philadelphia school system for demonstrating to their eighth and ninth grade students what they need to know and be able to do for entering a specific vocation.

The Safety Education section presented the AVA-NSC Joint Safety Committee's recommendations on Wednesday morning.

J. E. TePoorten presided. Lois M. Corbeil dealt with the subject as it affects business education. Home appliances and coming equipment was presented by John Claude, and farm equipment by Carlton Zink.

These presentations were followed by an open discussion.

The Agricultural Education Association had meetings for discussion and study practically from their first meeting on Wednesday, July 31, to their business meeting, Thursday, August 8.

The first general meeting of the Industrial Arts Education section took place at 9:00 a.m., Monday, August 5.

M. Ray Karnes was the chairman for the meeting.

The subject for discussion was "Research Findings With Implications for Teaching Industrial Subjects."

(Continued on page 6A)

Now . . . for the first time, the ideal 3-in-1 combination of "Power, Performance, and PRICE" in a unique Router-Plane-Shaper loaded with exclusive features, plus revolutionary new low-cost router bits.

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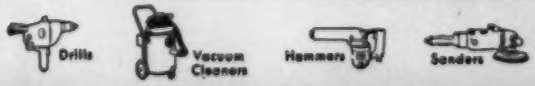

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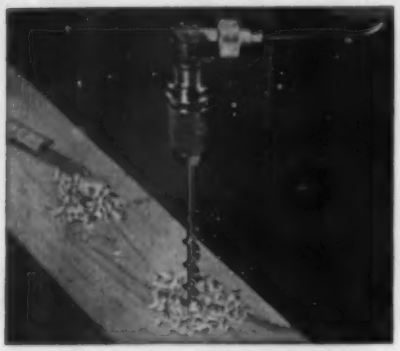
help get school shop projects done on time



The faster, cleaner, always accurate boring action of Irwin wood boring tools saves time and materials, steps up class room efficiency. Projects get done on time. The quality of the finished job stimulates student interest and appreciation of good workmanship. And replacement costs are lower, too. Irwin wood-boring tools are made to last much longer. Put Irwin to work in your shop and see. Order from your school shop jobber or independent hardware dealer.

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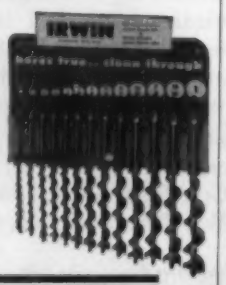

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the original solid center auger bit
•
screw drivers
screw driver bits

ASSOCIATION NEWS

(Continued from page 4A)

John A. Jarvis spoke on experimental research as a basis for improving instruction in industrial education.

Rutherford E. Lockette then discussed effects of level of aspiration upon skill development, and Willis E. Ray presented a speech on relative effects of direct instruction and independent study on basic approaches to teaching understanding and skills.

A panel then discussed the presentations given.

At the Monday afternoon session a series of group discussions were staged.

Joseph Schad acted as chairman.

Group I. Interpreting the industrial-arts program. (What implications are involved and what steps shall the profession take.)

Group II. Teaching multiple activities. (How is it being done and what are the more desirable patterns?)

Group III. Improving working conditions of teachers. (What are the more desired conditions, and what can the profession do to get them accepted?)

Group IV. Improving professional standards. (What should be our goals and how may the profession contribute to their realization?)

Group V. Strengthening the teaching program. (What are the more desirable practices and what steps can the profession take to get them more widely accepted?)

A breakfast followed by the business meeting was held on Tuesday, August 6.

The National Conference of State and Local Supervisors of Industrial Arts under the chairmanship of Robert M. Worthington was held on the morning of August 5.

Each person attending this session was asked to join one of the five groups which were to discuss problems submitted by state and local supervisors.

Questions on the topic — Common Interests and Differences of Industrial Arts and Trade and Industrial Education — were discussed.

On Thursday, August 8, at the morning session, leaders of industry and industrial arts met to plan what industrial arts was to do for the students in such subjects as drafting, electricity, metal, and wood.

On Thursday afternoon the discussion was centered around the question of how to meet the educational needs of slow and fast learners.

Trade and Industrial Education

At the Monday session of the Trade and Industrial Division, under the chairmanship of M. Ray Karnes, the theme of the discussion was "Research Findings With Implications for Teaching Industrial Subjects."

John A. Jarvis spoke on the subject "Experimental Research as a Basis for Improving Instruction in Industrial Education."

Rutherford E. Lockette followed with a speech on "Effects of Level of Aspiration Upon Skill Development," and Willis Ray presented a speech on the "Relative Effects of Direct Instruction and Independent Study on Basic Approaches to Teaching Understandings and Skills."

On Monday afternoon the topic of "Manning Local Program of Trade and Industrial Education" was studied by taking a look at the points of view held by the state director of vocational education; the superintendent of schools; the local director of vocational education; the teacher educator, and the directors of trade and industrial education for girls and women.

A joint meeting with National Association of State Supervisors of T. and I. Education, and National Council of Local Administrators of Vocational Educators and Practical Acts was held on the morning of Tuesday, August 6.

(Continued on page 276)

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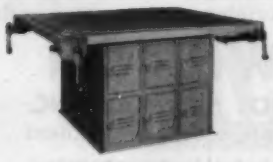
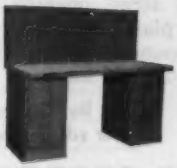


WOODWORKING BENCHES

TOOL STORAGE CABINETS

GLUE BENCHES



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Students learning on Parks Planers benefit not only from the safe, easy, and accurate operation of these planers, but also from the practical experience of working on the same type of high-speed, precision built planers they will eventually use in their trade. The Parks No. 20, 20" Planer (at right) has a 4-knife cutter-head with a speed of 3600 R. P. M. and offers two feed speeds—20 and 40 F. P. M. or 40 and 80 F. P. M. Available with knife-grinding attachment at additional cost.

THE **PARKS** No. 20
20" Thickness PLANER
WITH KNIFE-GRINDING ATTACHMENT

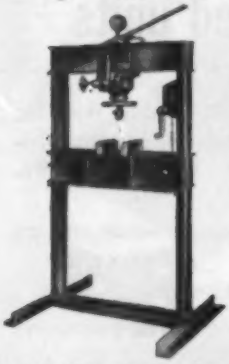
THE **PARKS** HEAVY-DUTY
12" Thickness PLANER

At left is the Parks Heavy-Duty 12" x 4" Planer—a compact, sturdy thickness planer with feed speed of 16 F. P. M. at 4000 R. P. M. Will handle material as short as 6" and as thin as 1/16". Both planers are priced low enough for even the most modest shop budget. WRITE FOR COMPLETE DESCRIPTIVE LITERATURE.

THE **PARKS** WOODWORKING MACHINE CO., Dept. 22 1546 Knowlton St., Cincinnati, Ohio
MANUFACTURERS OF QUALITY WOODWORKING MACHINES SINCE 1887

DAKE PRESSES for School Shops

Shop training is most helpful when your pupils use the same practical presses they are apt to find when they work after graduation.



DAKE HYDRAULIC PRESS Model 25 H

Includes pressure gauge, hand wheel for rapid advance, automatic ram return, and table lifting device. 25 tons capacity.

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Have large opening and slotted table plates. Available in single and compound leverages, with capacities from 1 to 25 tons.

Catalog No. 350 describes Dake Presses suitable for school shops. Write for a free copy.

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16 advanced design models, continuous and rapid acting. Write for free catalog and teaching aids.

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Wilton Vises Are Sold By Leading Distributors Everywhere

STANLEY SHOP TALK

SURFORM
No. 296 — Plane type

New! "SURFORM"®
for surface forming

A new concept in cutting tools that will be popular in your school shop. ***SURFORM'S*** 450 cutting edges make quick work of cutting wood, wood or fibre composition boards, plastics, soft metals, etc. Fast as a flash for fitting, trimming, smoothing and shaving. Each cutting edge has its own throat through which cuttings pass . . . no clogging. Die cast aluminum bodies and black hardwood handles. ***SURFORM*** is available in file type (No. 295) and in plane type (No. 296). Both tools use the same replaceable Sheffield Steel Blade.

SURFORM
No. 295 — File type

NEW! STEEL HAMMER— STANLEY STEELMASTER

The finest hammer ever made! Tubular steel handle that will not break . . . has shock absorbent neoprene grip. Rim of face is induction coil tempered . . . an important safety feature that minimizes chipping. Perfectly balanced. Available now in 13, 16 and 20 oz. curved claw models, and 16 and 20 oz. ripping claw models.

Screw-Mate®
Stanley No. 1525
Drill-Countersink

This new Screw-Mate does 4 jobs at once — drills pilot hole and shank clearance, countersinks, and always stops at exactly the right screw depth. Fits chuck of hand drill, power drill or drill press. 24 sizes — from ½" x No. 5 through 2½" x No. 12. ¼" shank. Screw-Mate counterbores and plug cutters also available.

NEW! HEAVY DUTY SANDERS

The new Stanley heavy duty belt sander is the answer to faster cutting, smoother finishes. Whether for rough sanding or fine finishing of wood or metal or plastic, the H31 takes the work out of sanding.

H31 Belt Sander

The Stanley heavy duty orbital sander is tops for finishing or refinishing work. Those who work with wood, metal or plastics will find it a fast cutting tool for satin-smooth finishes.

H36 Orbital Sander

Use this coupon for more detailed information and school shop help.

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FREE ☐ Please send me Stanley Tool Catalog No. 34.

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School_____

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Personal News

DR. BARNARD SELECTED FOR CONVENTION

Named to the 1958 national convention program committee of the Department of Audio-Visual Instruction of the National Education Association has been Dr. David P. Barnard, director of the audio-visual center of Stout State College, Menomonie, Wis.

The convention will be held next April 18–24 in Minneapolis, but in the meantime the national convention program committee has held meetings in Philadelphia and at Lake Okoboji to complete the convention program.

Dr. Barnard was named to the national convention program committee by Robert deKieffer, president of the Department of Audio-Visual Instruction, and by other national officers and delegates.

PLUMMER NAMED SECRETARY

Fred L. Plummer, Warren, Pa., has been appointed National Secretary of the American Welding Society. He assumed his new duties at once, and maintains his office at the Society's National Headquarters in New York City.

The appointment was made to fill the vacancy created by the resignation of Joseph G. Magrath who served as secretary for many years.

Mr. Plummer is a former president of the Society, having held office from 1952 through 1954, and he has served also as chairman of many committees in the Society.

DR. HUSS ASSIGNED TO THE PHILLIPPINES

Dr. William E. Huss, professor and chairman, department of Industrial Arts Laboratories at State University Teachers College, Oswego, N. Y., has been appointed to the Overseas staff of Stanford University.

Dr. William E. Huss

The staff, composed of four American industrial-arts educators, will be stationed at the Iloilo School of Arts and Trades in Iloilo City, Philippines. There they will work with the faculty of that institution to develop an improved program of industrial-arts teacher education. The purpose of the program will be to prepare industrial-arts teachers for service in underdeveloped nations. This is an opportunity for American industrial-arts educators to show how industrial arts, as a part of a general education program, can be adapted to meet the needs of these areas.

State University has granted a two-year leave of absence to Dr. Huss for this assignment. He expects to return to the Oswego College staff at the end of that time.

Dr. Huss was graduated from the Utica High School, the Oswego State Normal School, and received the B.S. degree from Ohio State University. He received his M.A. degree from Ohio State in 1946 and his Ed.D. degree from Pennsylvania State University in 1951.

His professional experience includes service in two public schools in New York State and wartime service as instructor of machine shop at the U. S. Merchant Marine Academy at Kings Point with a rank of Lt. (jg) USMS. He served on the staff of Oswego since 1939.

He has conducted research on the unique contributions of industrial-arts student teaching to discover professional and technical teaching abilities through a program of evaluation and appraisal.

Dr. Huss assisted in the preparation of a textbook by photographing exemplary practices in industrial arts. He has also contributed to professional magazines in his field. Dr. Huss is cosponsor of Phi Chapter of Epsilon Pi Tau, a member of Phi Delta Kappa, Iota Lambda Sigma, and other professional associations.

H. M. KARCHER RETIRES

Harry M. Karcher, associate professor of industrial arts electricity, State University of New York Teachers College at Oswego, N. Y., retired at the end of the academic year.

Mr. Karcher went into teaching from the electrical industry, leaving an electrical engineering office in Buffalo, N. Y., to study at Buffalo State Teachers College under a state scholarship for vocational training. He came

(Continued on page 22A)

SHELDON U.S.A.
CHICAGO
Variable Speed
PRECISION LATHES
A new series of 11" and 13" Precision lathes with . . . toolroom accuracy . . . spindle speeds to 2,000 r.p.m. . . . instant and automatic selection of speeds . . . increased horsepower to spindle . . . and a full range of toolroom and production accessories for greater versatility.
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complete specifications . . . detailed explanation of new variable drive . . . information on many new production accessories.
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BENCH LEVEL

A moderately priced precision level with main vial and double plumbs. 4", 6", 9", 12" and larger sizes. Black wrinkle finish with machined bearing surfaces. Base grooved for use on cylindrical work.

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SET OF TOOLS

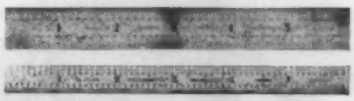
No. 902A has 9" combination square; No. 902B a 12" square. Both have 1" micrometer, center gage, center punch, 6" rule, 4" inside and outside calipers, dividers and hermaphrodite calipers. Other sets available.

NO. 124A
INSIDE MICROMETER

Capacity 2–8 inches. Set includes Satin Chrome micrometer head with ½ inch movement, measuring rods, spacing gage and spanner wrench. Auxiliary handle also available. Larger ranges available.

NO. 596
PENCIL DIVIDER

Bow-type side adjusting divider with twin chucks that hold steel points or pencil leads. Excellent for drawing or layout work. Capacity, fully open, approx. 3¼ inches.



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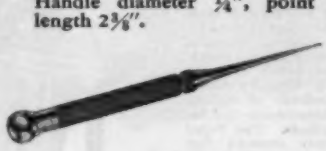
SURFACE GAGE

Small, lightweight, ideal for school shops. Hardened steel base has V groove for cylindrical work and retractable aligning pins for linear work. Adjustable scriber snug plus rocking bracket for extra fine adjustment. Weighs only 10 ounces.

NO. 70A
POCKET SCRIBER

Reversible point telescopes into knurled stock. Hex head prevents rolling. Chuck holds tempered steel point securely. Handle diameter ¼", point length 2⅜".



FREE EDUCATIONAL AIDS

New Bulletin 1203, "How to Read, Use, Care for Micrometers and Vernier Gages." Also, "Training Aids Bulletin No. 1202" which shows many Starrett training aids available free or at small cost.

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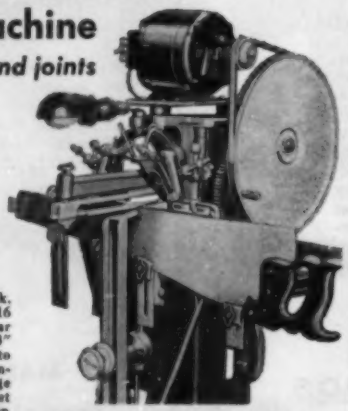
SAW FILING

This ONE Machine

automatically files and joints

HAND, BAND, CIRCULAR SAWS



The Foley Saw Filer is ideal for sharpening saws used by students in school shops. It keeps them in tip-top shape, faster and better than by hand filing. Used by Army, Navy, hundreds of manual training departments and industrial plants. The Foley is the only machine that files and joints all hand, back, and miter box saws from 3 to 16 points per inch, crosscut circular saws up to 16" diameter (24" optional), and band saws up to 24' long. Patented jointing principle automatically evens up large and small teeth, so saws cut faster, truer, cleaner — stay sharp longer. Foley filed saws have less breakage and last longer.

30-DAY TRIAL OFFER

You may have the privilege of using the Foley Saw Filer in your own shop for 30 days. Write or send coupon for details and list of school users.

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Please send information and Trial Offer on Foley Saw Filers.

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School.....

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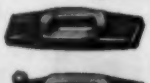
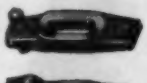
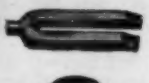
ARMSTRONG

SET-UP *and* HOLD-DOWN TOOLS







Teach the safe, modern way to set up work — with ARMSTRONG Set-up and Hold-down tools. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents.

Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

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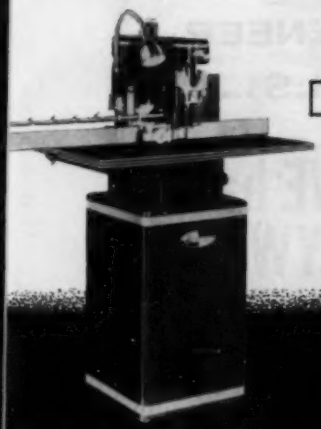
Widest range of lever and power operated paper cutters in sizes suitable for use in school shops. Rugged construction and special safety devices make these ideal for school shops. Also have wide application in handling numerous school paper cutting requirements.



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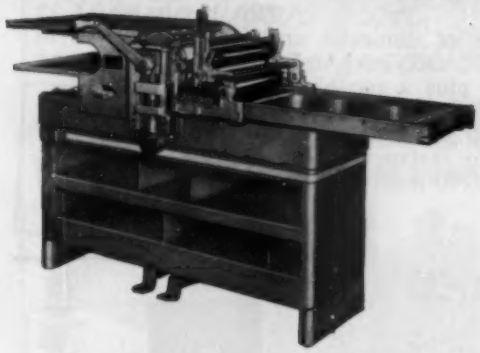
Challenge SAFETY ENGINEERED printing equipment

A Complete Range of Hand-Operated and Modern Power-Operated Equipment for All Types of School Shops



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13 models including the Style E widely used for school use. More advanced models used for reproduction proofing for engravings, offset platemaking or direct image making of duplicator or small offset plates. Widen scope of school shop.

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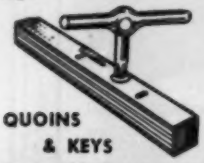
A complete selection of labor-saving devices used in print shops of all sizes. including .....



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Model 140
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SMOOTH CUTTING ACCURACY

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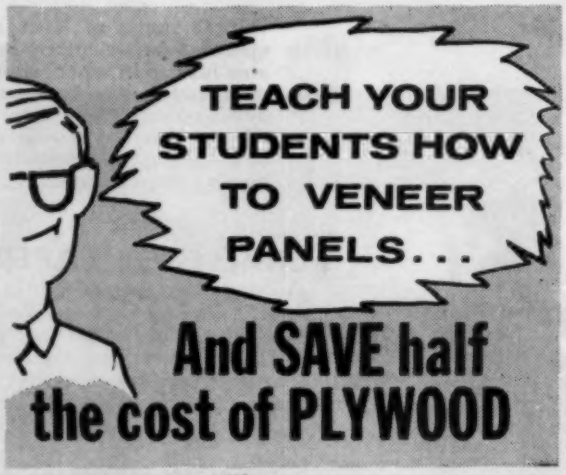

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With our new process, you can veneer panels without the costly or cumbersome equipment usually required for this work. With it you can make panels that are equal in every respect to those made by a factory with heat and pressure. Not only do you save money, but you are able to teach your students a modern technique of a fundamental woodworking process. At substantially below factory cost, you can veneer exotic, foreign species. Write for information today.

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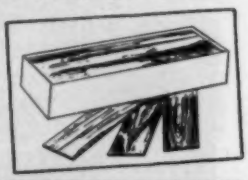
VENEER KIT . . . This handy kit of 32 species of domestic and foreign veneers in 4" x 9" size, each labeled with specie and origin plus a pamphlet describing our new veneering process, is available to instructors for just $3.00 postpaid.



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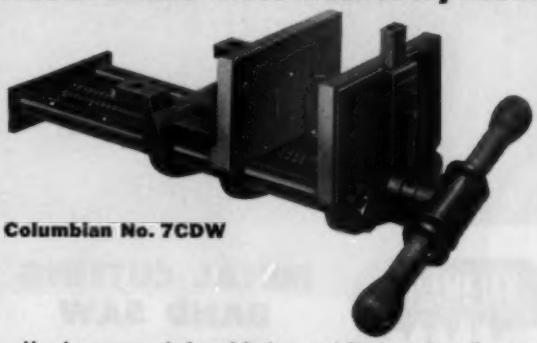

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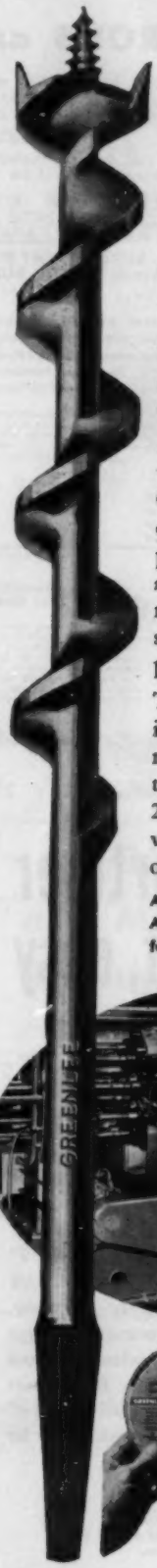

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The craftsman who *really* knows tools can instantly see the *extra* quality in a GREENLEE 22 Solid-Center Auger Bit.

And when he puts these fine bits to work, he is assured better results, for all GREENLEE 22 Bits are of uniform high quality. In their manufacture all cutting parts, point, throat, and twist are *automatically milled* on a battery of precision machines. Cutting edges are true . . . screw points are accurate . . . squares are perfect . . . shanks never vary.

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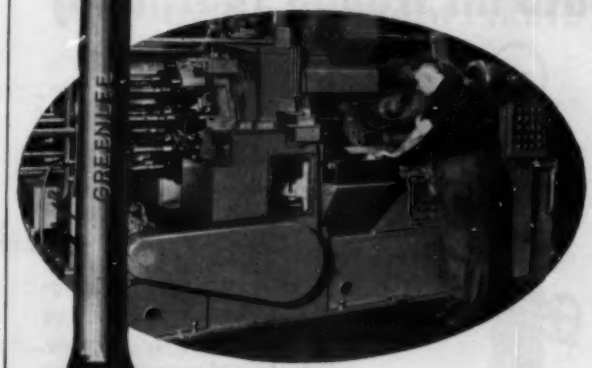

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Full cut, properly fitted to protect clothing. Strong tapes. Two roomy pockets for pencils, notebooks, etc. Low cost, Can-Pro aprons have served the schools for over 38 years.

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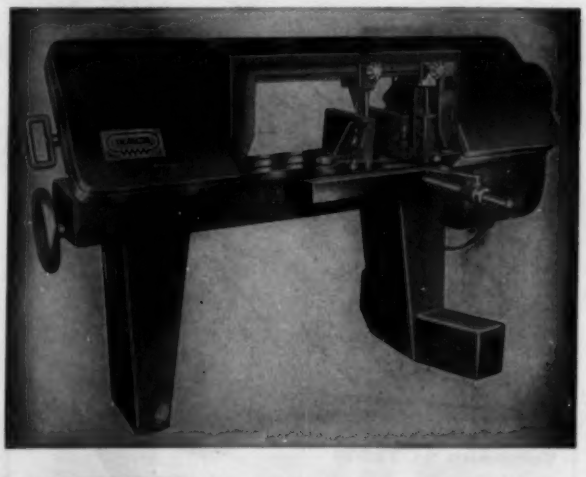

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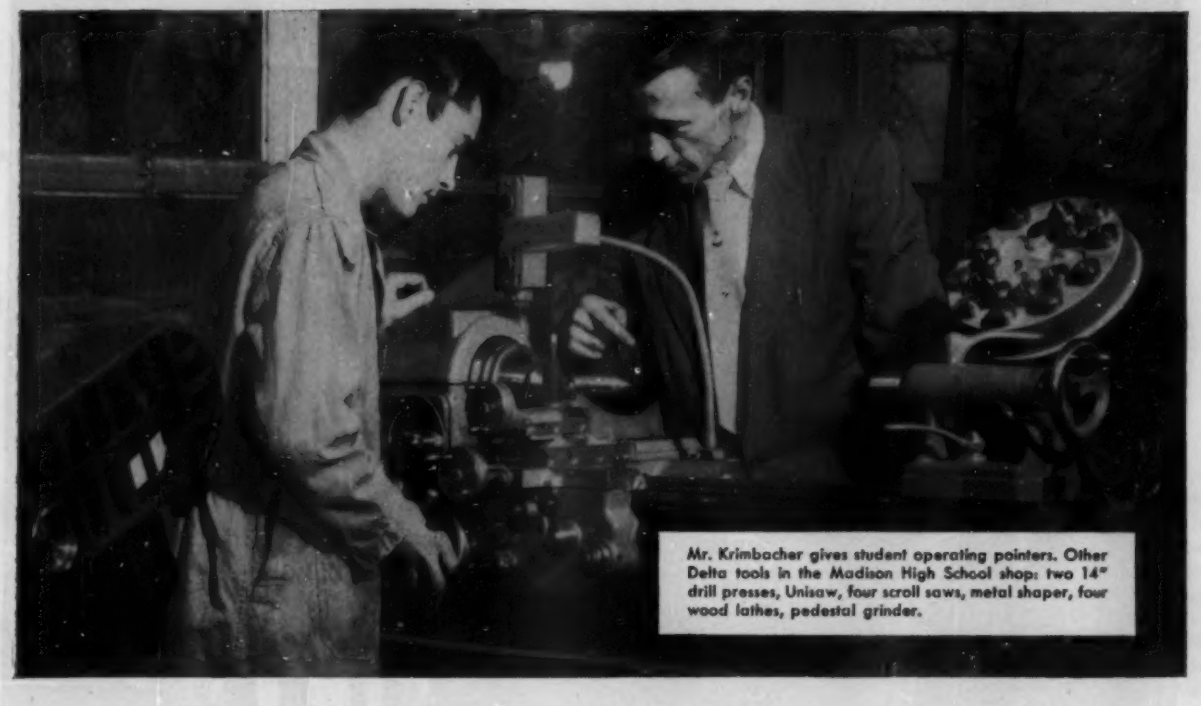

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Industrial Arts and Vocational Education
The Shop Teachers' Professional Magazine
OCTOBER 1957

The Problem of Graduate Study in Industrial Education

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Director, Department of Industrial Arts, and Chairman, Division of Applied Arts
San Jose State College
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Like most schools and educational endeavors, in this country, teacher education had its inception in Europe and is a foreign importation.

The first training program for prospective teachers was given by Roman Catholic priests in France as early as 1672. This effort took root and was followed by similar activities in Germany and Switzerland. Among the German leaders were Francke, the first to include manual activities, as an essential part of his school's curriculum; followed by Hecker, the founder of the Royal Realschule, and the father of secondary education in Germany. The most effective work, however, was the accomplishment of the Swiss educational reformer, Pestalozzi, the father of industrial arts, and Fellenburg, the father of vocational education. These men received their basic concepts of applied education from the philosophy of Rousseau, which was based upon *sense impressions*. These men believed that by providing a proper environment and a functional type of education society could be improved. They were of the opinion that a child must be trained symmetrically, i.e., physically, mentally, and morally. Cubberley, in his *History of Education*, pointed out that the working guide of Pestalozzi and his teachers was "read nothing, discover everything, and prove all things." In addition to mental training this school of thought held that the hand and heart must be trained, as well as the head. These new concepts of education changed classroom procedures and called for new techniques of instruction. It resulted in the establishment of the first modern normal school at Yverdon, Switzerland, where Pestalozzi achieved his greatest success.

Most students of education in this country are aware of the fact that our system of education was not only a foreign importation but was patterned after the Prussian system; so ably fostered and supported by Frederick, William the Great. It was free, compulsory and for both sexes, but as someone remarked, "Everything was for the people, but nothing was by the people." In other words, everything was planned and imposed by a centralized authority. Subsequently our imported schools were obliged to be modified to meet American needs. This was also true of the normal training school for teachers which was planned along French and German patterns. The term *Normal School* is of French origin (Ecole Normale or Model School) and remains with us, although most of the former *two year normals* have been expanded into four year teachers' colleges.

The first normal school in this country was established on July 3, 1839, in the town hall at Lexington, Mass. Later, two more were opened, at Barre and Bridgewater, in the same state. The guiding influence was the great Horace Mann, who had visited Pestalozzi's school and was greatly impressed by its organization and results. This type of teacher training institution soon became very popular and spread beyond the New England and Eastern States, to the Middle West, and to the South, and eventually throughout the nation. Its primary purpose was to train elementary teachers.

Training Shop Teachers

When manual training was introduced into American schools (1880) there was no trained shop teaching personnel. Shop teachers were recruited from craftsmen in industry or from academic teachers, already employed, who were handy with tools and who had an interest in this new teaching area. In fact, until a generation ago, a shop teacher with a bachelor's degree was a rarity and a curiosity. Today it's an accepted fact.

The late Professor Albert F. Siepert, former dean of Bradley Polytechnic Institute, Peoria, Ill., wrote in a Federal Bureau of Education Publication (Bulletin, 1918, No. 37):

> The training of special teachers of manual arts is of comparatively recent origin. Most of the institutions whose courses have been studied in the preparation of this paper have organized definite curricula within the last decade. It is therefore apparent that the pioneer days are still with us.
>
> The Massachusetts Normal Art School, established in 1873, was among the first schools in the United States to offer courses of this sort. However, the school early turned its attention to the art field and has not specifically trained teachers of the type we are considering. The Trenton (N. J.) School offered certain technical courses as early as 1890, or a little later, but it was only the man of unusual ability who would be selected as a special teacher of manual arts. Pratt Institute developed a combination art and manual training course about the same time. However, some of these students later went to Teachers College, Columbia University, for courses in pedagogy, for which adequate provision was not made at Pratt Institute at that time. By a curious coincidence, the present Teachers College students, a generation later, may get their technical courses at Pratt Institute.
>
> The first definite organization of a course to prepare special teachers of manual training was made by Teachers College in 1891, when Professor Charles A. Bennett was called from the principalship of the St. Paul (Minnesota) Manual Training High School to become head of the department of manual training. He had the honor of offering the first course in the pedagogy of the manual arts ever given for an advanced degree. He also had the privilege of determining in a large measure the character of the Macy Manual Arts Building, which became the model in arrangement and equipment for many other schools. The first man to graduate from this course was William F. Vroom, who is still engaged in teaching in the New York public schools.
>
> In the Middle West small beginnings were made in private institutions, such as the Chicago Manual Training School, which later became a part of the University of Chicago; the Francis W. Parker School; Bradley Polytechnic Institute; and in the State normal schools. The most recent additions are the special State normal schools for training these teachers, and the departments of manual arts in our State universities.

Today more than 200 colleges and universities offer teacher training programs in the area of industrial education (industrial arts and industrial-vocational education). In most states a bachelor's degree is necessary to teach industrial-arts activities and an increasing number of industrial-vocational teachers, who must first qualify as craftsmen, are also earning baccalaureate and advanced degrees. A recent study by Drs. Doane and London of the University of Missouri reveals that between 1930 and 1955, 132 institutions of higher learning granted 3420 masters' degrees and 48 institutions granted 371 doctors' degrees in industrial education. While this list of colleges and degrees granted is incomplete, it shows a trend of teacher preparation unprecedented in the annals of American industrial education.

The Graduate Program

The need for graduate work and degrees is particularly important for teacher educators. Their professional rank and salaries are dependent upon advanced degrees and study. The initial Yearbook (Yearbook I, 1952) of the American Council on Industrial Arts Teacher Education visualized the typical industrial-arts teacher trainer, after studying the qualifications of 500 men employed in teacher education, as:

> He was born in New York state in 1909 and is forty-two years af age. He is married, has two children, and is the holder of a Master of Arts degree. He has taught over seven years in the public schools and approximately ten years in institutions of higher learning. He has contributed very little along the lines of published materials. He is twice as likely to be a member of the American Industrial Arts Association and/or the National Education Association as he is to hold membership in the American Vocational Association and/or the National Association of Industrial Teachers Trainers. The chances are about even that he has traveled abroad and that he is a member of Epsilon Pi Tau. His chief avocational interest is that of outdoor sports.

With the need of research in all areas of education and added requirements for teaching certification, as well as the need for professional respectability, it is not surprising that graduate work for industrial teachers has grown very rapidly. It should be noted, however, that the Doane and London study also shows that while 48 institutions granted doctors' degrees, 10 institutions granted 73 per cent of them; and 76 per cent of the masters' degrees were granted by 20 of the 132 institutions listed. The implication can be deduced from these data that many institutions are granting higher degrees which lack staff, physical plants, and other facilities necessary to provide strong or effective programs of graduate work. A sort of "follow the leader" program has been attempted. There is scant evidence of thorough educational planning and organization. There is, on the contrary, considerable evidence of mediocre programs, the expedient of extending existing courses, the lack of a suitable graduate faculty and other essential features considered necessary for a worthy graduate program.

Another factor which baffles and befuddles graduate students frequently is the inability of college officials to give them authoritative answers to their problems; particularly, as they relate to the specific program to be followed to earn an advanced degree. Teachers-in-service, especially, desire to know the length of time required to complete a degree, the number of required units to be earned in a major and a minor field, thesis requirements, and numerous other problems which arise to harass them. A frequent complaint is "My major adviser says, 'you should take work from this professor, from that professor, etc.,' until I'm thoroughly confused." "Why can't someone tell me very specifically what I'm supposed to do?" Such criticism is unjustified and indicates a weakness and the necessity for a well-organized program based upon sound and valid policies and educational principles, whether the program is on the undergraduate or graduate levels.

Graduate Program Policies

Among the most frequent questions and problems which arise in organizing and administering a graduate study program and for which answers are sought by a faculty are the following with an attempt to give, at least, tentative answers:

1. *What are the major differences between undergraduate and graduate course requirements?*

   The four-year undergraduate program is herein divided between Lower Division (Freshman-Sophomore year) and Upper Division (Junior-Senior year).

   A. *Lower Division*

   1.1 A specific course outline — purposes and course requirements — furnished by the instructor.
   1.2 Introduction to basic theories, fundamentals, and principles of course or subject area.
   1.3 Introduction to problem solving techniques.
   1.4 Suggested reading and reference materials furnished by the instructor.
   1.5 *Entirely teacher directed.*

   B. *Upper Division*

   2.1 A specific course outline — purposes and course requirements furnished by the instructor.
   2.2 Application of basic principles of subject.
   2.3 Advanced problem solving.
   2.4 Opportunity for individual study and experimentation, reference reading, some research.
   2.5 Writing acceptable term papers.
   2.6 Individual, group, and committee reports.
   2.7 *Largely teacher directed.*

C. *Graduate Courses*

3.1 Admission to courses on the basis of demonstrated ability to do above average work (better than C grade) in undergraduate courses, with a B grade average in the senior year preferred.
3.2 A tentative course outline furnished by the instructor.
3.3 Assigned special and advanced problems.
3.4 Individual research and experimentation.
3.5 Preparation of bibliographies and reference materials.
3.6 Preparation of annotated bibliographies.
3.7 Reports relative to individual and/or committee study and research.
3.8 Prepare scholarly term papers.
3.9 *Teacher guided but with major student responsibility.*

2. *What restrictions, if any, should be placed upon enrollments in graduate courses?*

Ans: This is a decision which should be made by each major department. A minimum enrollment of six and a maximum of twenty seems to meet with majority approval.

3. *What should be the difference between similar courses offered at upper division (senior year) and those at graduate levels?*

Ans: If a graduate student is admitted into an upper division course and given graduate credit he is usually required to do additional work, such as, a term paper, extra reading, and preparation of reference materials. It should be the privilege of each department, however, to specify course differences. Furthermore, it is essential that a "core" of subject matter or courses (minimum of 4 to 6 semester hours) be developed within each major department to be taken by all majors within a given department.

4. *How should course requirements differ for graduate students who have certain undergraduate deficiencies but are admitted to graduate work on the basis of maturity, experience, and other essential qualifications?*

Ans: If students lack certain undergraduate prerequisites they should be required to complete them without credit and in addition maintain a grade of B in the graduate course.

5. *What part should prerequisities play in determining qualifications for admission to the graduate course?*

Ans: A better than average grade (C) in undergraduate work. Approval should be vested primarily in the department concerned.

6. *Should some graduate courses, in addition to the thesis course, be restricted only to persons who have qualified for candidacy?*

Ans: Yes! Students should be selected and approved specifically by the department concerned and any course which leads directly to the thesis should be so restricted.

7. *What standards should apply for written and research work and other course activities associated with graduate work?*

Ans: Adequate competence in oral and written expression; breadth, depth, and understanding of subject matter content involved; the use of style and techniques contained in an established guide (Exp. Campbell's Guide for Thesis Writing); plus the necessary manipulative skills and abilities necessary for acceptable performance of assignments, problems, experimentation, and construction of projects such as are involved in the fine and applied arts areas.

8. *What standards and methods should apply in grading and evaluating graduate work?*

Ans: In most institutions graduate students are required to maintain a B grade average. Some instructors are inclined to give only A and B grades. Many graduate students are of the opinion that only A's and B's are given. hence take the attitude "The least I'll receive is a B grade; therefore, there is little incentive to exert myself." Such an attitude is invalid and without justification. First, standards should be determined relative to the meaning and requirements of various grades. It is well known that great variations exist among faculty members relative to grades. It is a problem to be determined by the graduate faculty. A five point system of grade distribution based on the normal curve of frequency is recommended.

9. *What standards should apply in selecting faculty to teach graduate courses?*

Ans: (A) Faculty who are interested in advanced study, research, and experimentation; who possess an inquisitive type of mind; and who are interested in working with graduate students. (B) Faculty who themselves have pursued graduate work successfully and have earned either the master's degree, or the doctorate, or both. Instructors should possess, at least, the same or a higher degree to which their graduate students aspire. (C) Resident faculty are the key people in any graduate program. Hence visiting instructors, particularly instructors hired for the summer session only, should be selected with care if they are assigned to teach graduate courses. Visiting instructors may assist in guiding and counseling graduate students, but resident and permanent instructors must assume responsibility for the graduate program and students enrolled therein.

10. *What is the role of the library in graduate study?*

Ans: With the possible exception of the major adviser, the library is the graduate student's most valuable asset. The literature in the field of industrial education is fragmentary and sparse. It is the responsibility of each department to build its own graduate materials in the library, in co-operation with the librarian. Furthermore, limited library facilities demand close scrutiny of thesis topics; without proper library materials great difficulties are encountered in trying to write scholarly research papers. Furthermore, students should not be required to travel great distances to locate materials or, as a whole, be required to use libraries off campus.

11. *Should graduate courses be taught in extension, i.e., off campus?*

Ans: The majority of faculty people reply in the negative. Their reasons are: (1) lack of college atmosphere and environment, (2) lack of library and laboratory facilities, (3) extension courses frequently entertain rather than educate. It is currently a moot question — particularly on the Pacific Coast where many industrial plants and laboratories are springing up, especially in aviation, electronics, guided missiles, etc. Employees desire and demand advanced and graduate work to supplement their daily employment. These people are not only eager, sincere, and desirous for advanced training, but have an opportunity to use the facilities in their own plants, which few colleges can provide. For example, one large company has "a central library of 12,000 volumes, subscribes to 500 periodicals, and has 115 file drawers containing materials on metallurgy, engineering, industrial relations, business administration, commerce, and other subjects." When a situation such as this is encountered, opinions may change from a negative one to a positive one. The major factor should be to maintain standards whether a course is offered on or off campus.

12. *Should a time limit be set in which an advanced degree must be completed?*

Ans: Yes! A time limit from five to seven years should be sufficient time to complete a program of graduate study, unless some unusual circumstances arise beyond the student's control. Without a time limit many students will delay and procrastinate. The ideal situation is for students to remain in full-time residence. This is difficult and impossible for most teachers-in-service. The majority of this group must take their work in the summer session. In addition, most universities require a full year's matriculation in residence for the doctorate. Most teachers-in-service can meet this requirement only through the granting of a sabbatical leave or taking "time off" without salary. This situation can be met, in part, through scholarships and subsidies, but currently few are of sufficient monetary value to permit many qualified teachers to accept them. Our mathematics and science colleagues are leading the way in this respect. It is anticipated that shortly some provision for advanced training for industrial teachers of marked ability may also become a reality.

Summarization

1. Professional teacher education is a foreign importation and has been modified to meet American needs.

2. Teacher education for industrial teachers is of recent origin and continues on an experimental basis but, too frequently, on a makeshift basis, on the graduate level.

3. Graduate work for industrial teachers has developed largely within the past 25 years. Prior to 1930 there were probably fewer than a dozen doctoral degrees granted in this area of education.

4. Graduate work for industrial teachers is offered in more than 100 colleges and universities today, but many of the programs cannot be rated as being professionally strong.

5. In many colleges and universities, graduate students in industrial education are advised and counseled by instructors whose chief educational interests are in other educational areas.

6. Few colleges and universities possess the necessary facilities and resources to provide adequate graduate programs in industrial education.

Recommendations

1. Prior to the inauguration of a graduate program of study, much thought, concentration, and research is necessary for the organization of policies for its operation.

2. Faculty personnel should be acquainted with graduate policies and, as a whole, accept and support the policies when once they are established by an institution.

3. Adequate facilities and resources — faculty, library, and physical plant are essentials for an adequate graduate program.

4. Prerequisites and qualifications for students to be matriculated in the graduate program and admitted into candidacy for an advanced degree should be brief, clear, concise, and explicit.

5. The nation needs fewer institutions of higher learning offering graduate work in industrial education, but more of better quality and located geographically in more strategic locations. For example, a half dozen colleges and universities in the so-called "Far Western and Pacific Regional Area" (11 western states) could suffice for offering the master's degree and one major institution to offer the doctorate. When the quality of any product is good, education included, people flock to it. Teacher's College, Columbia University, is a good example. Teachers and administrators come to its doors from every state in the nation and from all parts of the world.

6. A definite line of demarcation, in course requirements, should be predetermined between undergraduate and graduate work, including a system of grading.

7. Size of enrollments in graduate courses and entrance qualifications should be determined largely by each department.

8. While there is a trend to eliminate the thesis for the master's degree upon the bases of number of candidates and the fact that few graduates of this degree will do research, but require more training in subject matter content in the area of their teaching assignment, the disciplinary value of writing a thesis cannot be minimized. This is especially true of industrial teachers who are usually more objective-minded than teachers in academic areas, and shy away, frequently, from oral and written expression.

9. A time limit should be set for the completion of a higher degree and a date line for the presentation of the thesis or project research prior to graduation; otherwise delay and dallying will frequently result.

10. The selection and assignment of graduate faculty is of great importance. Only thoroughly qualified people who are interested in graduate study should be assigned to teach courses in the graduate school. Extra precaution should be taken relative to part-time and summer session instructors who teach graduate students. In the final analysis, full-time resident faculty must assume the responsibility for the program.

11. An essential feature of any graduate program is the quality of the library facilities available. The literature in the field of industrial education is not very extensive, hence the graduate student will require much personal attention on the part of his major adviser and must also be an alert and resourceful individual. Each department should keep abreast of the literature in its field, try to keep materials current, and improve its library materials.

12. With the rapid rise and expansion of industry and technology, many institutions are having demands made upon them for graduate courses but lack laboratory and literary facilities and materials. If the employing firms possess proper facilities and resources, institutions may properly offer off-campus graduate courses without endangering the quality of their instruction or prestige. The important factor is not to lower standards of instruction and course requirements.

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Evanston Township High School
Evanston, Ill.

Too frequently little or no advantage is gained from one of the best teaching and public relations devices in the printing education field — a print shop open house. Sponsoring such an event increases student interest in the printing field, depicts the printing trade to the general public, and even serves as a motivational aid for students taking the printing courses.

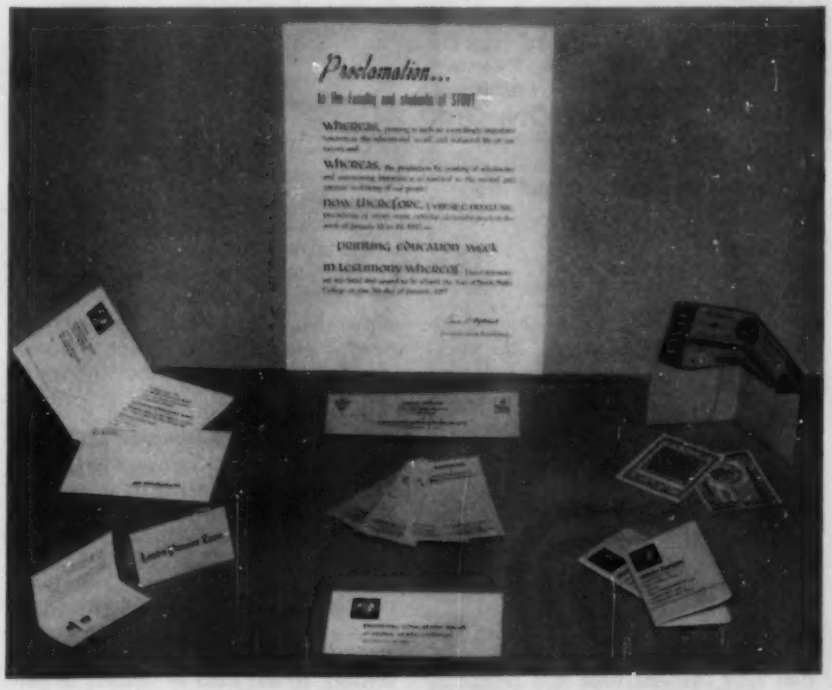
The original stimulus for an open house can occur in one of several ways. The instructor may take the initiative. It may result from the combined interest of instructor and students. Or, from among students in the school printing club, the idea may evolve almost without obvious direction by the instructor. The latter method, in particular, has proved very satisfactory at one educational institution.*

No matter on which of the aforementioned bases the idea for an open house originated, early planning is vital, especially for such aspects as sponsorship and objectives. Often when the project evolves from the printing club, its members may agree to share cooperatively whatever moderate expenses are necessary. However, if the members or their club treasury cannot meet even moderate costs, or the instructor has decided to accept the major part of the responsibility, he may have to approach the administration for financial assistance. If the instructor sets forth sound educational objectives for the open house, he should have no trouble in obtaining any small assistance needed.

Timing, too, is very important for the success of an open house. If the event is to be held during the school day, arrangements must be made to excuse students from their regular school routine. Other scheduling possibilities include semester test week, a school assembly period, after school, some evening, or even a half day event held in conjunction with the open houses of other shops. In view of obtaining maximum publicity and motivation, perhaps the best possible time for open house is Printing Education Week.

Vital to any print shop open house are carefully planned tours of the print shop. Displays must be meaningful and interesting to even casual observers. One display could trace the production of a printing job from raw materials to finished product, listing the costs and amount of materials used. Another exhibit might depict the progression of a block cutting and printing process or of a silk screen job. Still another might explain the production of the school newspaper or annual.

The print shop tour will be more vivid and will be remembered longer if visitors are presented with mementos of the occasion. Most printing clubs like to prepare such souvenirs right in



Samples of souvenirs which can be given to visitors attending an open house. In the illustration are shown an invitation, blotter, bookmark, notebook, and other materials adopted by printing students to describe Printing Education Week. The Confederate currency and Lord's Prayer piece of type were purchased commercially

*The Stout Typographical Society, Stout State College, Menomonie, Wis.

the shop. Such items could include note booklets imprinted with the visitor's name, printed blotters, or bookmarks. However, if funds permit, such commercial souvenirs as Confederate money (available from General Mills) or a piece of 12 point type on whose tiny face appears the entire "Lord's Prayer" (sold by Perfection Type) are appreciated by the visitors.

Students will have an opportunity to gain valuable experience in leadership if they are given the opportunity to act as tour guides. These students will necessarily have to brush up on their printing information if they are to lead educational tours. Other members of the class can act as equipment operators and demonstrators.

All tours should be made interesting and thorough, but as brief as possible. Long, rambling orations about processes and equipment can easily defeat the purposes of the open house. The tour path must be laid out in a logical pattern, preferably in the order of operation. Group size should be kept small, between 6 and 10 persons. Time should be included to permit visitors to ask questions along the tour route.

If funds and facilities permit, tours may be climaxed with the serving of coffee or hot chocolate and donuts in a large, quiet area, perhaps a classroom especially set up for the occasion. Here the visitors can sit and discuss with others what they saw on the tour. A little color can be added to the program by having two or three attractively dressed girls serving the refreshments.

In summary, it can be seen that a print shop open house achieves many desirable outcomes. Possibly its greatest potentiality is the opportunity for student planning and participation. The event is also useful in depicting certain aspects of the printing trade to the general public. Initiative planning of this sort is usually well received by school administrations.

One other value of an open house is perhaps not as educationally sound as the rest, but it has utilitarian value. Preparing for a print shop open house is a painless method of giving the shop a thorough cleanup.

There may be other plans for operation of a very successful printing education open house, but the technique just described has thoroughly proved itself. Adjustments can of course be made to fit specific situations. However, no matter what modifications are necessary, such a project, from both the educational and public relations standpoint, is well worth the effort.

The Reading Problem, a Vocational Shop Teacher's Responsibility

LYMAN J. LAUGHTON, 3rd.
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The responsibility for teaching reading to deficient readers in the vocational high schools is generally conceded to be a problem of the English Department.

If the present gap between the workshop and classroom were bridged, students would advance swiftly. Shop instructors firmly believe that reading development is of fundamental importance to all progress. With their complete assistance, reading classroom work and shopwork can be unified.

An extensive research program discloses that methods of reading instruction have changed since first taught by the alphabet method. At one time a kinesthetic process of tracing letters in sand and on slates was used, during a period when reading materials were scarce and a greater percentage of the population was illiterate. Later, a variety of phonic methods were in vogue, inducing children to read by sound elements.

Reading a Functional Skill

Modern reading is regarded as a functional skill, rather than an exercise. People are aware of the importance of a solid reading background. A successful businessman is an intelligent man, who has broadened his scope of living through knowledge gleaned from reading.

The ultimate measure of any reading activity is the kind of readers it produces. Many adults today have a poverty of reading interests. Other adults interested in reading widely with the ability to evaluate varied types of material read, had the enduring desire to read created in them when they were children.

A survey of vocational schools shows that many pupils have been unsuccessful in academic courses. Reading retardation in many phases is directly concerned. It is important to produce maximum reading development within the capabilities and environment of these vocational pupils. All students who suffer a reading deficiency are not dullards, which is conclusive evidence that some bright students are poor readers.

Vocational students are pursuing terminal education and preparing to earn a livelihood. Some of these students for a variety of reasons do not intend to enter college. It is their earnest desire to learn the basic fundamentals of a trade, and to accumulate such education as is necessary to become worthwhile, constructive, well-adjusted, and intelligent citizens. Other students wish to stop school at the end of a definite period, and must of necessity crowd as much instruction into a limited space as possible. To devise a satisfactory accelerated program to meet their individual needs, it is im-

portant that their reading ability be such that steady progress will be made in their chosen trades.

A well-rounded reading program should be organized to attain the following goals: first, to teach those students to read who have never read before; second, to increase their speed of reading and comprehension; third, to use reading to improve their daily lives effectively; fourth, to interweave their reading with their shopwork both in thought and action; and fifth, to read extensively, deeply, and critically, enjoying it sufficiently to read regularly.

Reading is done for two main reasons; to transmit pleasure to the reader, and to seek information or knowledge on a specific subject. Each of these types demands its own techniques and skills.

Testing for Readiness

The question of "When shall a child read?" has been argued for decades. The whole question of reading readiness is by no means settled. A child who may be old enough chronologically may be mentally immature, average, or above average with limited experiences. Coefficients between reading ability and mental age show a definite correlation. Another important factor of a child's readiness may be his physical health. Periodic checkups by the school Medical Department will sift out those with functional defects and treatment recommended. The individual adjustment of the child's inner self is also a primary consideration in determining reading readiness.

Standardized tests are widely used in estimating this readiness. Many vocational schools give such tests periodically. The reading conscious shop instructor by close and harmonious co-operation with the counselor may use the resulting information to fulfill his true obligations to the student. A shop teacher must develop a concept of what a comprehensive reading readiness program should include and endeavor to meet the requirements. Reading readiness can be developed. It embraces the sum total of experiences that gradually blend into learning, permitting the reconstruction of the facts behind the printed symbol.

Vocational shop teachers have their pupils under personal supervision more school hours per week than all other teachers combined. The classes are small, individual instruction is practical, hence he is thoroughly familiar with the abilities and shortcomings of each student. While every trade is taught as a unit, the related sciences, mathematics, and trade theory are taught in the shop, and on the job. The study of these subjects involves reading with its fundamental skills. Each pupil has selected his trade and is vitally eager to advance. This intense interest removes the burden that abstract reading imposes. Remedial reading can be integrated with shopwork so the average pupil improves without realizing he was subjected to remedial work. This removes the stigma which befalls those who attend *dumbbell classes.*

Sources of Material

A world of instructional material in which students show unusual interest is available to the shop teacher. These materials incite pupils to extend additional effort to enrich their trade knowledge. Large manufacturing companies publish miscellaneous advertising matter, booklets and charts which can be easily graded and used with an eye to remedial instruction. The trade class offers opportunities to make work type reading both practical and functional.

Administrative restrictions, stereotypical courses and strict supervision to which the classroom teacher is often subjected are not so prevalent in shopwork. A shop teacher is allowed much freedom in the construction of his courses, since each student in related shopwork progresses individually advancing as quickly as his own initiative and ability will allow. The meeting of goals and actual knowledge produced in the shop is generally considered more important than the methods used to accomplish them. Co-ordination between the shop teacher and the classroom teacher develops readers who will be practical citizens and workers of tomorrow.

The most widely used literature in the shop is the written manuscript, or typed job sheet giving complete job procedure. To stimulate advancement, these job sheets must be interesting and informative. This leads to genuine reading improvement, at the same time the pupil absorbs trade information, learns to follow directions, to organize his materials and to evaluate the results of his labors. The jobs are arranged in order of complexity, while the job sheets are written for various levels of ability with definite objects in view. This reading matter cannot be written on too difficult a plane. If the student is unable to comprehend the written material he will reap no benefit. One must avoid reaching the pupil's frustration point, or he will assume a defiant attitude toward all future reading. If the written content is of a challenging nature, the student is inspired to advance.

Science and Theory in the English Course

In the field of related trade information, we encounter the sciences and theory upon which operational functions are based. Materials used for this education may well assume reading instruction aspects. Library training can be incorporated by assigning outside books according to the aims of the shop student. It is a good plan to create situations where a definite desire for additional material is sought by the pupil.

While a *related lesson* is being conducted, silent and oral reading can take place. Words the student will meet may be used with the dual purpose of helping students who need developmental reading experiences while absorbing trade knowledge. The study of *related trade information* involves writing of articles, themes, and other papers by students based upon personal shop and class experience. Visual analysis and reading for meaning promote patterns which are essential to better reading. By such experiences the student acquires confidence as he raises his abilities and so the success wave of his trade experiences improves his reading rapidly.

A shop teacher's success is indicated by the amount of gainful information which he imparts to his students and how fluently they are trained to use their learning. By periodic quizzes the teacher may check on the student's knowledge of his trade as well as his ability of comprehension in obtaining accurate ideas, organizing them and retaining such information. Questions may be designed to estimate versatility in shifting from one type of reading to another. Varying the rate of reading and the skills employed is an important achievement; therefore facility in this respect should be appraised.

The Shop Library

The establishment of a shop library provides experiences which will remain with the pupil. Students respect the shop teacher and will follow his example in reading select books which he places at their convenience.

Vocational shop training while essentially a training for a way of life, is more than the teaching of manipulative processes. It can be a contribution to the education of the whole child. Adequate social adjustments may be fostered in the shop. The teacher must begin where each pupil is, in terms of capacity, talents, interests, and material needs, and guide his development into appropriate channels. Progress will be attained by some, who in turn will arouse the laggards to forge ahead.

Reading is a responsibility of all teachers and must not be overlooked by shop instructors. It is a proved fact that *better readers qualify as better tradesmen.*

TV's Challenge to Industrial Arts

ROBERT V. ESMOND
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Northern Illinois State Teachers College
De Kalb, Ill.

With a *classroom* covering 25 counties and a potential enrollment of 1,000,000 "pupils," the industrial-arts department at Northern Illinois State Teachers College, De Kalb, recently* taught a lesson in leatherwork on a grand scale via the magic of television.

The experience of this industrial-arts group merits special attention, for it represents the kind of television situation now facing or soon to face the hundreds of cultural and educational organizations which cannot think in terms of operating TV stations of their own. Among these organizations are the industrial-arts departments in schools across the nation.

Last summer Northern was invited to co-operate with WREX-TV, Channel 13, Rockford, Ill., in that station's public service programming. A volunteer faculty television committee set to work surveying departmental activities for course work which would lend itself to development into a television program.

Because the college had been granted a 15-minute program period every second Tuesday evening, Northern soon appreciated the fact that the possibility of a formal course offering via TV was eliminated. Instead, it determined that the purpose of its series — named "Four Good Years" — was, first of all, to leave a favorable public relations impression with the viewer and, second, to provide truly enriching educational experiences.

To achieve these goals, the college determined that as many departments as possible be afforded opportunity — if interested — to recommend TV program ideas and to develop those selected by the faculty committee. In addition, each department was encouraged to avoid the potpourri or travelogue approach in introducing its department's work to the televiewers. Activities representative of each department's curriculum were selected, referred to a TV advisory group of the faculty committee which, in turn, recommended them to me for development into TV programs.

Dr. Roderick Kohler, representing Northern's industrial-arts staff, soon found that his greatest problem at the outset was in determining what to exclude rather than deciding what to include in the TV program ideas coming from that department. With an industrial-arts curriculum which includes work in graphic arts, electricity, woodwork, metals, crafts, and power, the TV possibilities seemed limitless. Kohler narrowed it down to the crafts area and finally to leathercraft.

Still the problem of knowing what to include and what to exclude had not ended. Leathercraft and its many facets would lend itself nicely to a television series. But this was only one program and only 13 minutes long, at that. That's really all the time the presentation could take, allowing necessary time for the standard opening and closing announcements of the "Four Good Years" series. Yet that was the challenge of this and all other television programs in the college series: to know just how much to include, to say it, to show it, and to stop.

Meeting with the group three weeks before the program date, we determined that the program approach would be to attempt, despite the brief time, to carve a leather key case, from raw leather to finished product. Preserving the con-

The television program group from the Industrial Arts Department of Northern Illinois State Teachers College concludes a program rehearsal. Merle Mullikin, left, concluded the program with brief remarks about the other phases of Northern's crafts program. Leathercraft was the featured area for the presentation. In the center is Dr. Roderick Kohler of the industrial-arts staff, and at right is Ron Russell

* Editor's Note: This program was conducted in 1954.

As the TV viewer saw the demonstration of leathercarving. Russell's hands and his work were the center of attention; so the camera moved in for a close-up, giving the viewer the best possible vantage point from which to view the demonstration

tinuity of leatherworking was important to the dramatic impact which the program had to have.

This drama — call it showmanship if you wish — is vital in "selling" educational TV programs to the dial twisting TV audience, an audience which can, with that twist, tune out your program and bring in top network talent. Educators must appreciate this point and be willing to sacrifice some fine points for showmanship, if the situation so demands.

The industrial-arts program, as are all "Four Good Years" presentations, was telecast at 6:45 p.m. This is Class A viewing time, so far as the viewer is concerned. It is the most saleable time the station has to offer, for the station knows that viewing audiences will be high at that time. WREX, determined to develop itself as a community service station, took early steps to bring civic and educational groups from the area into its programming.

In regard to public service programs, the enlightened policy of that station warrants special attention. In granting a portion of its best viewing time — Class A — to Northern and other similar groups, WREX can, in return, demand that its public service programs be high in quality. In Northern's case, WREX placed "Four Good Years" between a network sports program. Northern's program quality had to be high. The best assurance of this was adequate advance organization plus plenty of rehearsal.

Kohler selected two industrial-arts students from his classes to assist him in the presentation. Working with his students, Ron Russell and Merle Mullikin, Kohler readied the crafts materials to be used and displayed on the program. Together they prepared an action outline on paper, listing in the left-hand column the action to take place and in an adjoining column a one-sentence description of that action. This outline is the basis for the final TV script which is used by the station producer in his instruction of cameramen and floormen. Then Kohler and his students determined the part each would have in the program.

Two weeks before the program, I entered into active work with the group. First of all they *talked through* the demonstration and took a time check. Careful advance planning by Kohler and his students eliminated the necessity for major revision. After asking the usual questions — "What shall we wear?" "Do we need special make-up?" — the group was ready for full-scale rehearsals.

Program materials for Russell's part — the actual leatherworking demonstration — included a set of leatherworking tools, a mallet, a slab of marble on which to pound, a strop on which the swivel knife was sharpened, and the pieces of leather to be worked.

Realizing that completion of a key case would take longer than 13 minutes, despite Russell's facility with the tools, he prepared, in advance of the program, a number of sample key cases. Each of the half dozen partially completed pieces only took the process up through a given step. Laid side by side they would have given the viewer a step by step evolution of the process of leatherworking.

Effective as this might have been in showing the continuity, it would not show how leather actually was carved. And so, during rehearsal as during the final program, Russell worked each step for a bit, giving the viewer a chance to see the process, then showed how the key case looked with that process completed. Then he moved on to the next step.

Mullikin's part in the program included a demonstration of lacing and cleaning leather. Also he selected representative samples of work from the various craft areas to display briefly at the close of the program. After six hours of rehearsal, the program was ready.

The industrial-arts group left Northern in mid afternoon and arrived at the Rockford station — 45 miles away — in time to "walk through" the program with the production director. Cameramen were briefed on angles and the floormen instructed on the setting for the program.

Kohler and his students had time to watch several *live* programs before it was their turn before the cameras. Week after week, that watching experience has proved of value to Northern's program groups, for it gives them opportunity to project themselves into the spirit of the TV presentation, to dispell any *butterflies* (this may not happen until they're on camera), and to become aware of the work of the floormen and cameramen, moving about taking their shots, throwing cues, and giving time signals.

Northern's "Four Good Years" series has a standard opening and closing for each program. The first thing the viewer sees is a motion picture sequence of campus scenes, with the title card superimposed on the shot. In the background is heard *a capella* singing by the college choir, a tape recording prepared by the Music Department well before the series got underway. As the music fades, the credit card is supered, I read a standard opening announcement, my camera comes "hot" and the program is on.

". . . and here to open our program is Dr. Roderick Kohler of the industrial-arts staff."

With the camera close in, Kohler introduced the program and mentioned, briefly, Northern's complete industrial-

Mullikin steps out of his role as program participant and helps with the timing. Here Dr. Kohler gets the 3-minute card. Russell is concluding his demonstration and waits for his next cue from Dr. Kohler

arts program. Dollying back, the camera picked up the group and spotted each student as he was introduced. Russell took over for his demonstration of leather cutting and opened with remarks about the soaking and preparation of leather for carving.

For the most part, the viewer saw only Russell's hands and his work during his presentation. An occasional shot included Russell. However, the impact of the program was in the its-happening-before-my-eyes aspects of the demonstration, and only close-up shots could put this across.

First Russell explained the pattern he had selected and traced it onto the leather. Doing, rather than talking, one key to successful TV presentation, was emphasized. After sharpening the swivel and explaining its use, he made the basic cuts in his design with the swivel knife.

A series of stamping steps followed, with the pear shader, camouflage tool, beveler, veiner, and decorative tools being demonstrated in that order. And with each demonstration the camera eye moved in for a close up, putting the demonstration right in the lap, so to speak, of viewers all across northern Illinois and southern Wisconsin.

As Russell reached the point of adding decorative cuts, Kohler cut in (the camera cutting to the group at that predetermined moment) and transferred the action to Mullikin.

Again, using close-up shots, the viewer saw Mullikin lace a leather piece and clean it. In conclusion, he stepped to a nearby table and pointed out the samples of work representing the other craft areas at the college.

"Let's see how Ron's project turned out," Kohler said, and for a moment viewers saw before them the finished key case, transformed before them.

The recreational aspects of leatherworking were obvious to the viewer. As Kohler closed the program and invited interested persons to direct inquiries on industrial-arts to Northern, he pointed out the fact that the presentation that night truly represented a segment of the industrial-arts curriculum.

How has the TV program series been received? A card from an enthusiastic PTA member somewhat indicates the general response to and acceptance of Northern's TV work. It read, in part:

"We have placed your programs on our recommended list. Our parent group enjoys them very much and we wish we could have such worthwhile programs more often."

Hours of planning, preparation of program materials, six hours of active rehearsal, and the acceptance and carrying out of many individual responsibilities produced the industrial-arts contribution to "Four Good Years." Kohler and his students can attest that *such worthwhile programs* are not come by easily. To contain effective simplicity, an educational TV program demands and must have a great deal of advance planning to be successful.

The television experience of Northern's industrial-arts department will not remain unique for long. As the so-called local or community television stations are established, other industrial-arts groups across the nation will find television opportunities and challenges readily available to them. The unlimited opportunity for effective TV programs on industrial arts fire the imagination. The television invitations are on the way. Together they offer a vital challenge to industrial-arts teachers everywhere.

DON'T LIFT IT ALONE!

DR. W. SCHWEISHEIMER
Highland Hall
Rye, N. Y.

Think Twice Before Taking a Two-Man Job on Your Own

A man known to have had a heart condition and high blood pressure for years suddenly died while lifting a heavy object. No autopsy was held. The death certificate listed the cause of death as undetermined. An industrial physician was asked whether lifting a heavy object could have brought on a fatal *heart attack*.

The *Journal of the American Medical Association* discussed the problem. Its expert stated that, in lifting a heavy object, one attempts expiration against a closed glottis (the narrow opening at the upper part of the windpipe). This means an increased pressure inside the chest, and this in turn leads to a reduction of inflow of blood to the heart. The flow within the coronary arteries which feed the heart muscle consequently is lessened.

In an already diseased heart, especially an arteriosclerotic heart, this decrease in the blood flow within the coronary arteries would be enough, the *Journal's* expert says, to produce arrhythmias in the heart, leading to fibrillation of the heart muscle and death. While this could be the sequence of events in the described case, other possible causes could be responsible as well.

The heart is a muscle. It will get tired by overstrain, just as arm muscles get tired. Repeated overstrain may produce enlargement of the heart muscle. Excessive exertion by lifting or pushing gives rise in a healthy man to signs of breathlessness, palpitation of the heart, giddiness, fatigue, pain near the heart. Such signs are the normal answer of the body to strain. The best advice is to

avoid overexertion and call a fellow worker for assistance when lifting heavy loads.

Eight Rules for Avoiding Damage Through Heavy Lifting

The Bureau of Labor Standards in Washington, William L. Connolly, director, has issued a series of rules which people should keep in their minds when carrying heavy loads.

1. Always carry the load close to the body.
2. Keep the back as straight as possible.
3. Lift with the leg and arm muscles.
4. Always have a clear vision over the load.
5. If the load interferes with normal walking — get help.
6. Never be afraid to ask for help in handling a load.
7. Bring in suggestions when you think some type of mechanical equipment will do a better job.
8. Housekeeping is important. Tripping hazards or objects on the floor can cause persons carrying a load to fall and be seriously injured.

Production of Hernia by Lifting Heavy Loads

Workers with known physical weaknesses such as tendency toward hernia, should not be put on jobs where lifting is required. A violent exertion, a sudden strain, lifting or pushing a heavy load may enlarge a gap in the muscle wall of the abdomen (belly) and cause a hernia.

A hernia or rupture is a protrusion of a loop of intestine through a weak spot on the muscle wall of the abdomen. This loop cannot be seen, it is covered with skin and fat. Only a small lump under the skin is seen. By far the greatest number of hernias which occur in industry, are the inguinal hernias; they appear in the groin, right or left. There are other hernias as well, but inguinal hernias are approximately 96 per cent of all hernias. Most laymen have in mind only the inguinal hernia when they use the term *rupture*, and they don't know that other types of hernia exist.

Knock-knees and other leg conditions are less frequent today, due primarily to the use of mechanical devices instead of mere hands and arms. Many jobs in industry are performed better by means of a mechanical aid. Where this cannot be done, the best means of lifting the loads by hand have to be decided. The construction of platforms, racks, benches, or similar aids will be helpful.

An industrial worker lifts a load too heavy for him which puts excessive strain on the muscles of his back. Some muscle fibers are ruptured, and he is struck with violent pain in the small of the back. He has to lay down on the floor, he cannot get up. Later the pain eases, he can move again, but not all cases are as fortunate. Despite the violent pain, acute backache (lumbago) may disappear soon. There is every reason not to repeat the heavy strain for quite some time. People who have suffered from sudden backache may easily get the same trouble again unless they are cautious.

Lifting Weights by Women in Industry

The selection of a woman for a job requiring constant lifting, carrying, pushing, or pulling should depend not only on her weight and height, but on the amount of strength she has. There is a general belief that the most economical load is about 35 per cent of body weight, but this may not apply to the individual case.

Experts have figured out that men should not lift loads more than 130 lb. in weight, and women should not lift loads of more than 65 lb. for intermittent work and 50 lb. for continuous work. Some states have laws that limit the amount of weight that women workers may lift. The regulations differ in various states, but 25 pounds is the usual limitation for lifting and 15 pounds the usual for carrying.

In California, e.g., the law limits weights to be lifted or carried by women to 25 pounds in any trade or industry. In Massachusetts the law prohibits lifting of cores the total weight of which exceeds 25 pounds, unless assisted by mechanical appliances that limit physical effort to 25 pounds. In Michigan, a highly industrial state, lifting of more than 35 pounds or carrying of more than 20 pounds when ascending stairs, is prohibited for women. Overhead lifting or stacking is forbidden.

What Can You Do?

Here are some principles laid down by the Bureau of Labor Standards for lifting heavy loads. Size up the load first, do not attempt to lift it alone if there is any doubt in your mind about your ability to do so. Make sure that your footing is secure. Get a good balance — this means feet fairly wide apart, 8 to 12 inches. Place the feet close to the base of the object to be lifted. This is important because it prevents the back muscles from taking all the load — hazard of acute backache.

Bend the knees outward and *straddle* the load somewhat, keeping the back as straight as possible. Now start pushing up with your legs, using your strongest set of muscles. Keep the load close to your body as you come up, taking full advantage of the mechanical leverage your body now possesses.

Lift the object to the carrying position. If necessary to change your direction when in the upright position, be careful not to twist the body — hazard of lumbago. Turn your body with changes of foot position. If you deposit the load on a bench or table, place it on the edge to make the table take part of the load and then push it forward with the arms or, if necessary, with part of the body in a forward motion.

In putting the load down to the floor surface from a waist-high carrying position, bend the knees and, with a straight back and load close to the body, lower the load with the arm and leg muscles.

Experienced Workers Can Teach Correct Lifting

If one day you feel unfit to perform weight lifting operations, do not fail to report immediately. People are more prone to accidents and injuries caused by muscular strain when they are slightly indisposed. That we know from practical experience.

Lighter work should be provided for these occasions. The employer who makes a careful study of the hazards peculiar to his own factory, mill, or shop where lifting operations are undertaken, can take the necessary steps to prevent this common cause of injury.

Experienced workers and foremen can do much good by demonstrating the correct methods of lifting to their less experienced fellow workers.

But as for yourself, don't forget the most important rule of all: Never be afraid to ask for help in handling a heavy load!

AUTOMOTIVE ELECTRICAL TROUBLE MAY BE ONLY FAN BELT TROUBLE

FRANK P. PLOVICK
Field Service Manager
General Motors Corporation
Delco-Remy Division
Anderson, Ind.

Car owners who think they are having trouble with their battery or generator should take a good look at their fan belts.

If the belt has become worn or loose as a result of severe winter driving conditions, slippage may occur on the generator pulley resulting in failure to charge. Many electrical systems have been condemned when a loose belt was the real offender.

Having trouble with penetrating oil stain "bleeding"? Seal in the stain, when it is dry, with a thinned coat of fresh, white shellac. — *Shellac Information Bureau.*

Industrial Arts and Vocational Education

JOHN J. METZ, Editor

TEACH ACCIDENT PREVENTION — On the Highway, in the Home, and on the Job

THE teaching of safety is a never ending job, and one that the teacher should never forget.

The motor vehicle is the number one killer. Many of our high schools are doing fine jobs with their driver education courses. More schools ought to follow their example and stay at it relentlessly. When the statistics show that approximately 38 thousand are killed, and 2 million are injured by the motor vehicle in one year, a serious problem is presented which the school and the teacher cannot overlook.

Many communities excuse themselves that they have neither money nor teachers for instituting such a course, but when, besides the loss of life, and the suffering of the injured, an estimated financial loss of close to $4½ million are experienced by the country at large, something must and ought to be done, and done without quibbling. Villages, towns, cities, counties, and states all find money for doing many things that have but a questionable value. A closer scrutiny would no doubt find sufficient cash to start some type of safe driver course, either in school or by the law enforcing body. It is better to give such a course before the damage is done, rather than have the culprit receive a prison sentence and probably a good lecture after he has been arrested for illegal or careless use of his auto vehicle.

Next to the automobile, the home is credited to cause the most deaths by accidents. The schools are doing much in teaching this type of safety education in the elementary school. The courses, however, can be materially improved. The very finest kind of academic and scientific education will be of no avail to the student unless he has received a continuous indoctrination of accident prevention throughout his school life.

The National Safety Council has a 12-page pamphlet available which in a colorful way pokes fun — but with a serious purpose — at the would-be home repairman, the man who gropes in the dark, and the lady who can't see over the top of a load she is carrying.

It also contains such necessary precautions to save the little ones who do not recognize danger, "Put bars across low windows and fasten screens securely."

Finally, we must not forget the dangers on the job. Accidents on the job pile up an annual record of approximately 15 thousand killed, 2 million injured, and $3 billion, 150 million dollars wasted. Industry, the home workshop, and the school shop (technical, industrial arts, T and I, agricultural and vocational) must take a serious view of their responsibility of teaching their students how to do their work safely at all times.

The National Safety Council says "Take care of your 10 best tools — your fingers."

"Working hands always are exposed to splinters, careless use of equipment, machinery and solvents, all of which are potential destroyers of the 10 best tools."

An example of one of their instructive safety sheets for the shopman is on hand soldering and brazing, two operations which present hazards many workers and do-it-yourself addicts are unfamiliar with.

The National Safety Council points out that if practices in hand soldering and brazing are not controlled properly, such hazards as lead poisoning, burns, dermatitis, fire, and irritation from fluxes may result.

That and more general information is given in recent Council Data Sheet D-445, "Hand Soldering and Brazing." This seven-page publication presents up-to-date information that may be applied in both industry and the home.

Use of gas-heated soldering irons presents a greater lead hazard, usually, than electric irons, since larger amounts of solder are heated. Other possible dangers of gas-heated irons are exposure to carbon monoxide from poor combustion, and gas poisoning from leaks.

The greatest health hazards with solders, though, are created by cadmium, zinc, antimony, and fluorides. Fumes containing them should be exhausted from the room, and lunches should not be eaten or stored near soldering operations.

Here are suggestions given for proper safety control in soldering operations:

1. Prevent ingestion of toxic materials and insist upon good personal hygiene.
2. Workers should be given annual physical examinations.
3. Protective clothing should be worn.
4. Keep equipment and soldering areas clean.
5. Precautions should be taken to prevent fires.

Similar safety sheets may also be prepared by instructors to cover other dangerous operations in shops for woodworking, metalworking, foundry, auto mechanics, electricity, and printing.

VOCATIONAL EDUCATION IN PAKISTAN

THE International Co-operation Administration of the Federal Government is sending Dr. M. D. Mobley, executive secretary of the American Vocational Association, to Pakistan to help that country plan a comprehensive program of vocational education. He will help with the development of plans, procedures, and priority action for implementing a vocational program in this new nation that came into being in 1947. He will also confer with vocational officials in India, Thailand, and the Philippine Islands before returning to the states.

Dr. Mobley is a native of Georgia, and has been executive secretary of the American Vocational Association since 1951. Previously he served as Georgia State Director of Vocational Education (1936–50).

He entered the educational field as a teacher and principal in 1923 after being graduated from the University of Georgia with a B.S.A. degree. In 1930 he earned his MS at Cornell University; in 1945 Piedmont College granted him the LL.D.

Under his leadership as state director, Georgia developed a program of vocational education that ranked fourth in the nation in total enrollment in federally aided schools. He has conducted studies of vocational education in California, South Carolina, Arkansas, and Jamaica in the British West Indies. He also served as a vocational consultant in Germany in 1947.

The AVA Executive Committee has granted Dr. Mobley a two-month leave of absence so that he may accept his Pakistan assignment. Lowell A. Burkett will serve as acting executive secretary until he returns to Washington.

Administering Classroom Instruction in a Large Vocational School

BENJAMIN J. NOVAK
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Classroom instruction in large vocational schools poses many organizational and administrative problems which are the inevitable consequence of a sizable educational program. Different comprehensive vocational schools have approached and worked out their administrative problems in different ways. In outlining the experience of one school, it is possible that the readers will note practices which they may wish to consider, or there may be some that have been approached differently and possibly more efficiently elsewhere. In either case there is ample justification for the sharing of experience. The school whose organization of classroom instruction is described in this paper is the Murrell Dobbins Vocational-Technical School in Philadelphia. It enrolls some 2500 day students in 27 different vocations in grades 10–12, plus a ninth-grade exploratory program. There are about 120 day school teachers.

What Are the Aims?

The administrative plan of any school is based upon the tacit or expressed educational outlook and views of its staff. What are the ends that seem to be most worthwhile in the instructional program?

The projected administrative organization will in practice show considerable alteration and improvisation on the basis of the quality and stability of the staff, type of students, community needs, available supplies and equipment, attitudes of employers, labor, and parent groups, and other factors.

The following were accepted by the faculty in 1952 as being worthy objectives[1] for the Dobbins Vocational-Technical School:

1. To prepare each pupil for effective entrance into a vocational field which he has selected, and for which he has received intensive preliminary training, this entrance to be on the most advanced learner basis of which the pupil is capable.
2. To include in this training those elementary and advanced elements of technology which will serve him as he has opportunity to advance in his vocation.
3. To provide full opportunity through a balanced classroom program for each pupil to complete requirements for the high school diploma and further education if he has the ability and the desire.
4. To include those elements of mathematics and science which will contribute most to the functioning of each pupil in his vocational field, and to include their application in the instruction.
5. To go beyond the objectives mentioned above and include as well those elements of mathematics and science which may lack immediate application but will equip the student for advancement within his occupation, or for his general education needs.
6. To pay close attention to the basic skills of communication, reading, speaking, and writing, and to developing those knowledges, attitudes, and appreciations that are sought through study of English, history, and social sciences.
7. To share with the home the responsibility for helping the pupil to improve his physical and mental health, and to guard his own safety and that of others.
8. To provide opportunity through a varied program of activities outside the classroom for each pupil through participation, to develop his avocational or recreational interests, and thus become an active and contributing member of the school community.
9. To accept responsibility within the limitations extant, for the placement of the pupil after graduation to the end that his employment may fit his preparation and provide opportunities to continue the learning process.

[1]The formulation is largely the work of J. Norwood Baker, principal, 1938–52.

The objectives stress the need for both general and specialized education. Although pains are taken to make classroom instruction practical and realistic in terms of student shop interests, it is by no means felt that all classroom work must be justified as having a bearing on some phase of the shop work. There are other equally important needs. The school gives a high school diploma, and a small but significant fraction of its graduates go on to college. The school is not, however, an accredited college preparatory institution.

An Organizational Plan

It is inevitable that there will seldom be enough students in a given trade to permit separate groups for classroom instruction. One immediate administrative necessity is the combination of student groups. One form of combination may be vertical, in which different grade levels of students within the same trade are placed together. Dobbins more than ten years ago decided on a horizontal grouping, in which students in different trades are combined on a given grade level. Although there have been some changes with the years, the combination pattern always followed has been basically horizontal for the classroom subjects.

When the combinations were first established, the fewer than twenty

trades were placed in three groups, given the arbitrary designations *A*, *B*, *C*. Later a fourth category called the technical group was developed, and as new trades were offered three additional groups were set up. It was not long before this random growth of groups, two of which had only one trade each, proved to be more of an obstacle than an aid to efficient administration. Starting in 1952 the principal, two vice-principals, co-ordinators, and department chairmen began a series of meetings which culminated in a reorganization of the classroom instruction in the spring of 1953.[2] Departmental meetings enabled the faculty to share in the project.

The present grouping of trades under the heading *X*, *Y*, and *Z*, is shown in Table I. The designation *trade* is used in a broad sense to denote any of the 27 different occupational majors. Prenursing, commercial practice, and home economics are not trades in the usual meaning of the term, but are so designated here in the interest of brevity. Each group has nine of the trades, although this equal distribution was not intended. In terms of students enrolled, there is less equality among the groups.

Many factors were considered in making the combinations. The major consideration was similarity in educational needs. The learner in baking obviously does not need the heavy emphasis of physical science for his trade that is called for by the machine design student. The X group instruction is more demanding academically than that of the Y and Z groups, although the three groups should not be thought of as "ability" groups.

It will be noted that English is required each semester, with one exception, during the three years. Two years each are required of science, mathematics, and social studies. Not shown on the diagrams are health, physical education, art, drawing, and music. The major subjects meet 5 45-minute periods each week.

Course names were chosen for clarity to students, teachers, parents, and to officials in industry, armed forces, and institutions of higher learning. Experience has shown that the terms *related science* 1, 2, and so on, are meaningless to most people. Thus, in order to differentiate the three kinds of physics 1, they are called respectively Physics 1, Vocational Physics 1, and Applied Physics 1. Inasmuch as some one-term science courses are given only in the spring or fall terms of the twelfth grade, it is necessary also to combine some science classes vertically.

[2]G. William Donovan, one of the vice-principals, is largely responsible for the initiation, prosecution, and detailing of the reorganization.

TABLE I. Grouping of Trades for Major Classroom Subjects
Murrell Dobbins Vocational-Technical School

Group	*X*	*Y*	*Z*
Trade Code	AD EI IC MD MS PM PN RH RV	AM CM CY FP PD PL PR SM WD	BA BC CA CC CP DM FM HE RP
Term No. 1 (10A)	English 3 Algebra 1 or 3 American History 1	English 3 Practical Algebra American History 1	English 3 Related Mathematics 1 American History 1
2 (10B)	Physics 1 Algebra 2 or 4 American History 2	English 4 Vocational Physics 1 Shop Arithmetic	English 4 Applied Physics American History 2
3 (11A)	English 4 Geometry 1 Physics 2	English 5 Vocational Physics 2 Applied Geometry	English 5 Applied Chemistry 1 Related Mathematics 2
4 (11B)	English 5 Geometry 2 American History 3	English 6 Numerical Trigonometry American History 2	English 6 Related Mathematics 3 American History 3
5 (12A)	English 6 Chemistry 1 Trigonometry (Sociology 1)	English 7 Metallurgy or Applied Mechanics American History 3	English 7 Applied Biology or Applied Chemistry 2 American History 4
6 (12B)	English 7 Chemistry 2 (Applied Mechanics) American History 4	English 8 Applied Mechanics or Metallurgy American History 4	English 8 Applied Chemistry 2 or Applied Biology Sociology 1

PN students may substitute Sociology 1 for Trigonometry.
Trades from Z group taking X group classroom subjects may substitute Sociology 1 for Trigonometry.
IC students will substitute Applied Mechanics and Sociology 1 for Chemistry 1 and Chemistry 2.
Metallurgy and Applied Biology are taught in spring term only.
Applied Mechanics and Applied Chemistry 2 in fall term only.

The groups as indicated are not arbitrary. *Y* and *Z* group students are placed after counseling in the *X* group if they so desire, and a review of their aptitude and previous school record appears so to warrant. An *X* group student, conversely, may find it more advantageous to carry a classroom program of another group.

The admissions committee as part of the placement procedure, classifies the entering student into the *X*, *Y*, or *Z* group, based on aptitude testing, interview, and examination of previous record. Subsequent changes are made after counseling, and take place in the main, by the end of the first half-year.

The existence of such a grouping procedure does not mean at all that a given class of, say mathematics, will have students from seven different trades. Enrollments are great enough in some trades that it is nearly always possible to have a class made up only of that one trade. Usually not more than two or three different trades are in one class, although in physical education, music, social studies, and sometimes in English, as wide a cross section of trades as possible is desirable. It is not the desire to keep the students compartmentalized altogether by trades. The grouping chart, then, is a useful guide in preparing rosters. In changing from one group to another and even to another trade, heavy emphasis is placed upon the guidance aspects of the educational program. Shop and classroom teachers assist students to work out some changes with the co-ordinators and counselors. Fortunately, the school has six full-time co-ordinators, and three full-time counselors.

Some Unfinished Business

The classroom half of the vocational program has always suffered from administrative, philosophical, and altogether general neglect in schools both large and small, throughout the country.[3] Shop instruction has proceeded with confidence and pride, in sharp contrast to the classroom work. The leadership in vocational education is basically not coping with the realities of classroom teaching and is procrastinating interminably in coming to grips with its problems. The people in authority are of shop origin, and have their hands full with shop matters. They are not at ease with classroom problems and are glad enough to be engrossed with other details. Whence then will come that leadership and planning in classroom instruction?

Classroom teaching in large vocational schools and to a large extent in smaller programs, too, is conducted by

[3]See also: "Problems in Related Instruction." Benjamin J. Novak, INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, Sept., 1943; "Whither Related Instruction?" Benjamin J. Novak, *American Vocational Journal*, Mar., 1950.

subject specialists, not shop teachers. With the major exception of New York City, the obvious need to encourage classroom teachers to assume responsibility and authority for their instruction has been practically ignored. Classroom teachers should be given time to work with shop personnel and vocational authorities in developing curricular material. Classroom teachers in vocational schools should be promoted to supervisory and administrative posts, at least in the classroom and other nonshop areas. Something is radically out of line in the current thinking that an educator trained in *one* trade is per se capable of supervising *all* the trades and classrooms in a large vocational program, while an individual who has not been a journeyman in a trade cannot supervise *any* part of a vocational school, even his own subject field.

Such a policy discourages qualified personnel from entering or remaining permanently in the vocational school. Entrance requirements are greater than for teaching in the academic high school, since industrial experience and special courses in vocational education are generally required in addition to the usual subject matter qualifications. The school day is usually longer, and the schedule more arduous. If coupled with this there is little or no possibility to advance, it is not to be wondered that classroom teachers are recruited and retained with difficulty by the vocational schools.

The general neglect in classroom instruction is well illustrated by the nature of national and regional conventions. The classroom aspects of vocational education very rarely appear on the agenda and programs. The officials in attendance, for the reasons already specified, are not active in that area. Even if there were worthwhile developments, the classroom teacher is likely to be at home teaching, and therefore, not present to benefit.

The immediate need is for the vocational leaders to consider promptly and carefully the immediate unsolved problems in classroom instruction.

Programs in curriculum development, using competent specialists in classroom subjects need to be encouraged with opportunities for professional growth and advancement to position of leadership, whether the posts be called department head, co-ordinator, supervisor, vice-principal, or whatever. Until this is done, the contribution of vocational education in both large schools and small, will not reach its fullest and greatest potential.

CODE ABBREVIATIONS FOR TRADES
Murrell Dobbins Vocational-Technical School

X-group

AD Architectural Drafting
EI Electricity, Industrial
IC Industrial Chemistry
MD Machine Design
MS Machine Shop
PM Patternmaking
PN Prenursing
RH Refrigeration and Oil Heat
RV Radio and Television

Y-group

AM Automotive Maintenance
CM Cabinet Making
CY Carpentry
FP Foundry Practice
PD Painting and Decorating
PL Plumbing
PR Printing
SM Sheet Metal
WD Welding

Z-group

BA Baking
BC Beauty Culture
CA Commercial Art
CC Child Care
CP Commercial Practice
DM Dressmaking
FM Food Merchandising
HE Home Economics
RP Restaurant Practice

Pre-Engineering Summer Workshop

R. E. COCHRANE
Director of Education
Littell Machine Company
Des Plaines, Ill.

Automation and the Littell Machine Company are closely related since the primary products of the Littell Machine Company are automatic feeding machines for punch presses and shears. The making of automatic feeds for many customers with various requirements involves a great deal of engineering since most machines are custom built to meet the need for their particular purpose.

Since engineering is so important to Littell Machine Company, a number of engineers and engineering draftsmen are employed. This practice has been becoming more and more difficult, since the engineering personnel is largely being taken by the bigger companies and are no longer available to some of the small companies. The pay scale can be equivalent and still the engineers seem to prefer large companies, probably because they feel the opportunities are greater. The administrative personnel at Littell Machine Company see this as an ever increasing trend and have decided to try to find a solution to the problem. The problem as it presents itself is, simply, how can a smaller company get engineers to see the great potentials in engineering with the smaller companies, as opposed to the large industrial firms.

With this problem confronting itself to the Littell Machine Company, a program was devised for training engineering students prior to graduation, in the hope that we would be able to procure the services of some of the people after graduation. This has been very well stated by Fred M. Littell, president of the Littell Machine Company:

The way in which this program has come about was that we, as a small company, have been somewhat timid about going down to the engineering schools and bucking the competition of large companies in bidding for the services of graduating engineers. It had been our impression that elaborate training programs were offered to the students by these big companies and we did not feel in a position to compete against them, especially from a standing start. Of course, the whole engineering graduate situation is very tight, as we know.

To avoid head-on competition with the big companies, we invited engineering students in their earlier years to work with us in the summertime, in order that we would get to know each other. We did not feel that we could take these fellows and simply throw them in a raw state into our engineering department, because the burden, with all of this greenness, and with all of the conversation which would have to take place, would simply bog down the regular work. Instead, the idea was to set up this group, along with proper leadership, in a separate physical location and indoctrinate them into our work.

Littell Machine Company contacted various colleges in the Chicago area, asking the co-ordinators to put our request on their bulletin board.

> Wanted-young men for summer pre-graduate Junior Engineering program, which will include drawing board work on Littell Engineering projects — also will give considerable emphasis on engineering practices and procedures, etc.
>
> Extra activities will include educational tours through three or four different industrial plants. Specific instruction period will be conducted each week on the following subjects: castings and foundry work; hydraulics; electrical devices; decimal dimensions procedure; bearings; pulleys, belts, and shafting; spring calculations; cams and gears; office procedure; and sales engineering. This pre-graduate junior engineering school will be directed by:
>
> Robert E. Cochrane — B.S. Western Michigan College of Education, M.S. Iowa State, and graduate student at: University of Illinois and Northwestern University. Program will start approximately June 14 and continue through August 31. Hours will be 8–12 and 1–5 each day . . . Monday through Friday.
>
> *Please contact Ed. Littell for Interview.*

During this period an ad was placed in the local newspapers stating in effect the same information as the letters to the colleges. From these sources we drew 55 applicants and tested them for their ability to understand mechanical relationships[1] and their ability to read blueprints.[2] We also gave them a practical test in drafting.[3] Interviewing was also a part of our selection program.

We finally selected 16 of the original 55 applicants for employment and utilization in our training program.

A course of study was compiled, especially designed to meet the needs for the Littell Machine Company program. From this course of study a schedule was worked up with the idea of keeping continuity in the course. However, there were times when this could not be adhered to simply because of the availability of speakers and of other companies scheduled.

The schedule was as follows:

Program for Summer Engineering Work Shop

1st Week, June 14–15
June 14 — Engineering office practice
June 15 — Engineering office practice

2nd Week, June 18–22
June 18 — Engineering office practice
June 19 — Engineering office practice
June 20 — Review of drafting practices, films and talk
June 22 — Noon dinner 11:30–3:00 Wilson Y.M.C.A. (Meet Littell Company Executives)

3rd Week, June 25–30
June 26 — Decimal dimensioning, by R. E. Cochrane (Littell Machine Company)
June 27 — Measuring instruments, by R. E. Cochrane
June 28 — Machine shop procedure. Trip in our shop.

4th Week, July 2–6
July 2 — Pelton Foundry, Milwaukee, Wis. (lunch at Milwaukee Airport), Mr. Stull and Mr. Sadofsky, Kenosha Brass and Aluminum Foundry
July 4 — Holiday
July 5 — Illinois Gear and Machine Company, Mr. Smiley

5th Week, July 9–13
July 10 — Allen Bradley Co., Mr. Roy
July 11 — 9:30 Howell Motors Mobile Unit, Mr. Fitzgerald
July 12 — Miller Fluid Power Company, Mr. Yant

6th Week, July 16–20
July 19 — A. Finkle and Sons-Forging, Mr. Ledin and Mr. Dolton

7th Week, July 23–27
July 25 — Inland Steel (all day). Not included due to strike.
July 27 — Gear Reduction Motors and Reves Drives. Mr. Nagey (Boston Gear Company)

8th Week, July 30–August 3
July 30 — Plain Bearings, R. E. Cochrane (Littell Machine Co.)
August 1 — McGill Bearing, Valparaiso, Ind. (all day), Mr. Brownell and Mr. Schafer

9th Week, August 6–10
August 6 — Welding Procedures, Mr. Braumas (Lakeside Bridge and Iron Works)
August 8 — Hydraulics-Illinois Institute of Technology, Mr. Einnick.

10th Week, August 13–17
August 13 — Trip to see our equipment in use.
August 15 — Springs-American Spring, Mr. Shields

11th Week, August 20–24
August 20 — Sales-Engineering, Mr. Sim Budlong, Littell Machine Co.

12th Week, August 27–31
August 27 — General office procedure, Mr. E. Littell, Littell Machine Company
August 31 — Afternoon dinner and party

The time and days not taken up by the schedule of events was utilized in the drafting room, drawing and designing Littell Machine projects.

Our program succeeded in giving these prospective engineers work experience in their chosen profession as well as a great deal of information on the various areas of engineering.

Continuous interviewing was in process throughout the program and the comments by the people in the program were interesting and informative. Statements such as: "This experience will enable me to make wiser choices of courses when I return to school in the fall." "I wish we could spend more time at some of the companies we visit; there is so much to learn." Many made ordinary statements such as: "The program is very interesting and I am getting a great deal out of it."

We of Littell Machine Company feel the program has succeeded in many respects. From the standpoint of the trainees they were given real work experience and consequently a taste of what the profession will be like. The trainee was able to enlarge his general engineering background. The program provided a substantial monetary reward toward his educational expenses. He became acquainted with the company, their policies, and personnel, as well as a firsthand account of how industry operates. The trainee also got a chance at practical analysis of his career interests and aptitudes against the qualifications required for a responsible job. With all of the above the trainee most certainly developed a sense of self-reliance and self-confidence.

The evaluation of the program from the standpoint of the company is entirely different than that of the trainee. We feel we have instilled in a number of men the engineering challenges which present themselves in a smaller company, and perhaps they will be more interested in working for a smaller company when they have completed their education.

[1]Flanagan, John C., Flanagan Aptitude Classification Test, Fact 13A Mechanics Form A, Chicago 10, Ill., Science Research Associates, 1953.

[2]Owen, H. F. & Arnold, J. N. Purdue Blue Print Reading Test, Chicago 10, Ill., Science Research Associates, 1942.

[3]Test devised by R. E. Cochrane primarily for Littell Machine Company, 1955.

We also offset some of the program's expenses by getting a certain amount of engineering completed. We feel our testing program was valuable since it did a reasonably good job of selecting technically qualified trainees. We are also convinced not all the trainees selected have the qualifications necessary for success with Littell Machine Company. The twelve weeks of the program gave us an excellent opportunity to evaluate the potentialities of the individual trainee.

We appreciate the co-operation of the many companies which gave us the opportunity to visit their plants and allowed some of their key men to aid us in our venture.

English Yew

ORVILLE A. OAKS
Wilmette, Ill.

The English yew (Taxus baccata), most noted member of the yew family, was undoubtedly a sacred tree to the Britons and the Irish of old, as clearly evidenced by their ancient churchyards, planted with these now magnificent old trees. Although statements are found claiming the yew as a funeral tree, a companion of the grave, among the old Celtic tribes, no reliable evidence is at hand to prove the aboriginal tribes or the Druids held this tree in such reverence. On the other hand, there is a show of evidence that the early Romans, as invaders of Britain, used the yew in their funeral rites in place of their native cypress and pine. It was thus associated with the passage of the soul from its old to its new place of rest. Certain it is that the yew from very early times has been used in connection with funerals. Evelyn's *Sylva*, one of the first works ever written on English trees, states: "The best reason that can be given why the yew was planted in churchyards is that branches of it were often carried in processions on Palm Sunday instead of palms." Even to this day some churchyard yew trees in England and Ireland are referred to as palms, and the Irish peasantry still cling to the custom of wearing sprigs of yew in their hatbands or buttonholes during the week of Palm Sunday to Easter. It is also the custom for mourners to carry branches of yew over the dead, and throw them beneath the coffin into the grave. Since the yew is an evergreen — ever living — the bereaved could well feel these boughs were a symbol of everlasting living, the immortality of man. Indeed, the yew can well be a fit emblem of immortality since it rarely ever dies, new shoots perpetually springing out from the old and withered trunks. Knowing primitive man's reverence for trees there is good reason for believing the yew tree had a part in the pagan religion of these ancients, the Christian monks later making it a part of Christian rites.

Aside from religious reasons for planting and protecting the yew, the very existence of the early Britons depended on this tree. It was the source of the famed English yeoman's longbow and crossbow, his weapon of the chase, and his protection in time of war. It was the boast of an old English yeoman that his longbow, made of branches of yew, could be bent by none other than an English arm. It was this same English arm, so history tells us, that darkened the sky with arrows from bows of yew, during the battle of Hastings in 1066, when the Normans under William the Conqueror invaded England. From early English times laws were enacted requiring the planting and protection of the yew for the use of English archers. The kings encouraged the use of the bow by various edicts, and acts of Parliament regulated their price, provided for their importation, and forbade their exportation. Those who dwelt within the royal forests were required to have in their possession a bow and sharp arrows. These various laws and regulations were carried in force until late in the reign of Queen Elizabeth during the early seventeenth century.

The yew, although not as old geologically as the oldest of trees, the ginkgo, is probably as ancient as the Biblical cedars. When the elephant and rhinoceros roamed through Britain, Greenland, and the now Arctic regions of North America, the yew was a common tree of those lands. Today, the English yew grows in Great Britain, Ireland, Sweden, Norway, Esthonia, and on south to the Mediterranean; in Asia it is restricted to northern Persia, Asia Minor, Armenia, and the Caucasus; also found in northern Africa and on the Atlas Mountains of Algeria.

Of the many historically famous individual yew trees in England, perhaps the Ankerwyke Yew at Staines is best known. For it was under this tree that the English barons held their conference with King John in 1215, and in its sight the Magna Charta was later signed. This yew is reported to be 30¾ ft. in circumference at 3 ft. above ground, and estimated at better than 1000 years old. One of my prized possessions is an 1830 London publication by Jacob George Strutt on "Portraits of Forest Trees Distinguished for Their Antiquity, Magnitude or Beauty" with drawings from nature. He not only has a sketch and essay on the Ankerwyke Yew but also on the venerable Fountains' Abbey yew trees, under which the old Cistercian monks lived while building their celebrated monastery, founded about 1132.

My samples of yew are from England and the northern India Kashmir Himalayas. The wood is a lovely orange yellow to pale red, deepening upon exposure to a rich red-brown leather or amber color, depending on the sample. One sample is beautifully grained, the spring and summer growth bands presenting distinct color markings varying from light to dark. Personally, I enjoy working the yew — some persons acquire a skin rash from the fine sanding dust — as it presents a firm even texture, close grained, medium in hardness, taking a smooth lustrous finish. Although the yew longbow and crossbow as weapons of warfare are long outmoded, as an archery bow for pastime yew still remains unexcelled. Perhaps the greatest present-day use of the wood, other than for bows, is for brush-backs, while the burls are cut into fancy veneers. My vase collection now has one turning of Pacific yew (Taxus brevifolia), but some day I hope to secure a piece of some venerable English yew for an added attraction historically.

Before storing plastic football helmets, give them a coat of pure, white shellac. The shellac should be thinned and applied when the helmet is dry. — *Shellac Information Bureau.*

The first radio signal was sent across the Atlantic on December 12, 1901. — *Wisconsin Military District.*

Problems and Projects

FOOTSTOOL SEWING CABINET

DONALD D. CHARTRAW
Granville High School
Milwaukee, Wis.

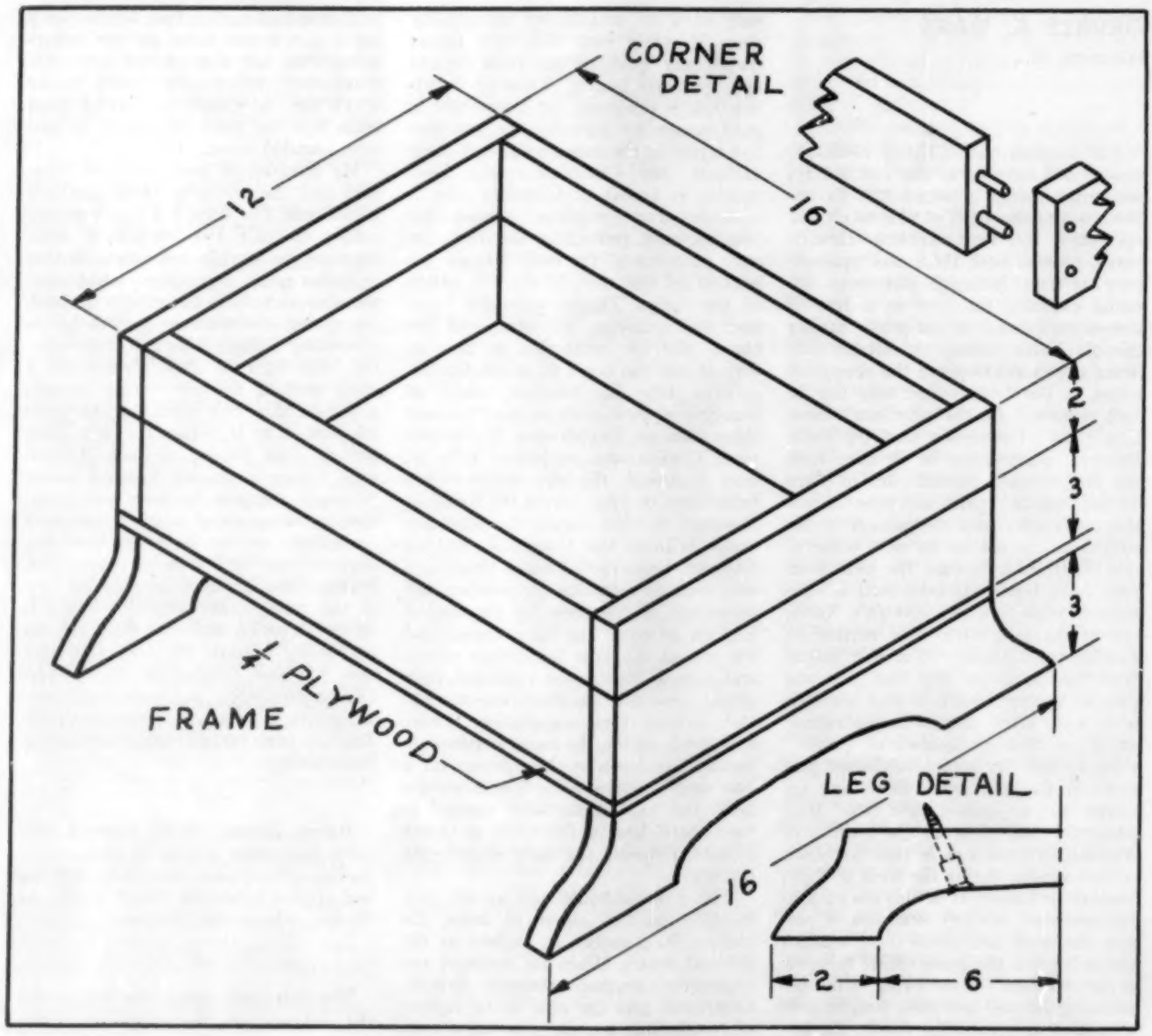
This combination footstool-sewing cabinet eliminates the untidy family sewing basket, providing instead a handy, attractive hiding place which protects sewing and mending from dust and household pets.

BILL OF MATERIAL

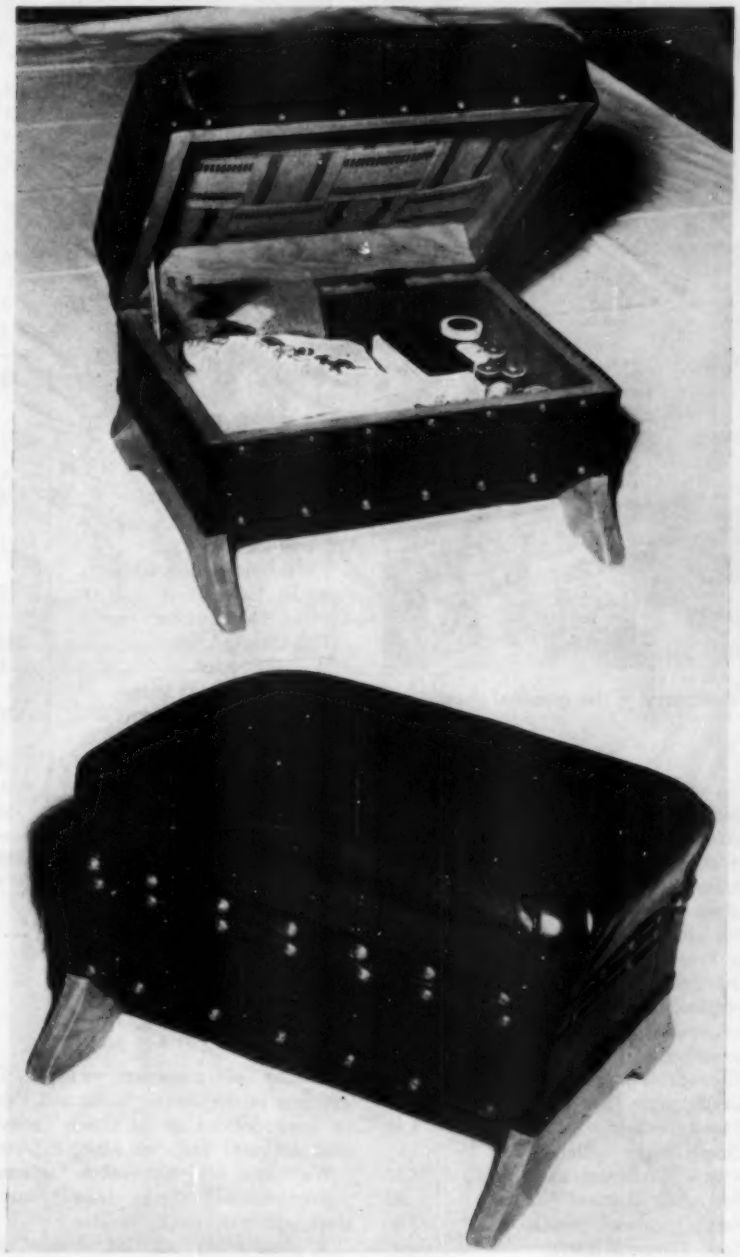
Top	*No. of Pcs.*	*Material*	*Size*
	2	No. 1 Comm. ash	¾ x 2 x 12
	2	No. 1 Comm. ash	¾ x 2 x 14½
Bottom	2	No. 1 Comm. ash	¾ x 3 x 12
	2	No. 1 Comm. ash	¾ x 3 x 14½
	1	Plywood	¼ x 12 x 16
Legs	2	No. 1 Comm. ash	¾ x 3 x 16
Hardware	4	F.h. wood screws No. 10 — 2 in.	
	2	Butt hinges 1¼ in.	

The project provides experience in two areas: woodwork and upholstery. Small enough to be completed in a semester's time, the footstool incorporates many operations in woodworking and upholstery. Its beauty and utility are sure to hold student interest and the finished project is a welcome addition to any living room.

Steps in constructing the project are as follows: (1) Read working drawing to determine number and size of members. (2) Select stock, being sure it is straight and



Details of the footstool sewing cabinet



Footstool sewing cabinet open for use, and in the closed position

free of defects. (3) Rough out stock, leaving enough to square to size. (4) Square all pieces to size indicated on bill of material. (5) Assemble, using through dowel joints and gluing all joints. (6) Remove stock for hinges before upholstering. (7) Finish inside of bottom by sealing and flocking to match or harmonize with outside covering. (8) Upholster with material to match the type and color of furniture in the student's home. (9) Apply gimp, spacing the decorative tacks about 1½ in. between centers. (10) Upholster top. The padding used will depend on the materials available in the shop. (The writer has used new foam rubber, used foam rubber from old car seats, horsehair, and other padding materials.) (11) Put on the gimp, being sure to match the decorator tacks with those on the bottom. (12) Attach finished legs with screws as shown on drawing. (13) Attach hardware.

If additional machine woodworking experience is desired, or if facilities for forming plastics are available, it is possible to build into the bottom of the footstool a sliding half drawer of wood or plastic. The design of such a drawer or holder is determined by the individual student and the sewing needs of his family.

TEXTILE EQUIPMENT, TOOLS, AND SUPPLIES

ROBERT McWILLIAMS
Associate Professor of Textiles
State University of New York
Teachers College
Oswego, N. Y.

Many requests from teachers for information about textiles show that this subject is increasingly being considered a necessary and desirable part of a general shop program. It is neither difficult nor expensive to start such an area in a general shop. The following list of equipment and expendable materials is furnished to assist those who plan to include textxiles in their laboratories.

The list is arranged in areas or units for convenience and organization. The equipment is intended to accommodate a class of six students. Much of the equipment and supplies listed may already be found in school industrial-arts shops or science laboratories.

Equipment

Designing or Planning Area:
- Water color tins
- Drawing boards
- Red sable brushes, No. 5
- Sponge

Dyeing Area:
- Bunsen burners
- Electric hot plate
- Copper dye tub
- Porcelain pans
- Tripods
- Glass stirring rods
- Scale or balance

Weaving Area:
- Wood and metal frames
- Four harness table model loom (8 in. width)
- Four harness table model loom (20 in. width)
- Four harness foot-treadle loom (27 in. width)
- Loom bench
- Warping board
- Shears
- Bobbin winder
- Stick and boat shuttles
- Tension box
- Bobbin rack

Knitting and Crocheting Area:
- Horizontal knitting frames
- Circular knitting frames
- Wooden crochet hooks

Equipment and supplies for the textile laboratory in the general shop

Hooking Area:
- Blue nose rug hookers
- Pencil type rug hookers

Fabrication Area:
- Late model sewing machine with attachments
- Pinking shears

Yarn Preparation Area:
- Wool hand cards
- Wool spinner

Miscellaneous:
- Large table for designing or planning
- Large table for fabrication

Materials List

Designing Area:
- Graph paper tablets, 8 by 8 checks per sq. in.
- Graph paper tablets, 4 by 4 checks per sq. in.
- Stick charcoal or charcoal pencils
- Sets of prisma-color pencils
- Sets of tempera water colors (12 per set)
- Drawing paper
- Sets of permanent textile paints

Dyeing Area:
- Should have gas or electricity for heating water
- Assorted prepared dyes

Weaving Area:
- Bags of jersey loops
- Ready-warped spools (cotton)
- Burlap feed bags
- Rayon-cotton rug yarn

Knitting Area:
- Knitting worsted

Hooking Area:
- Cotton rug yarn

Fabrication Area:
- Denim
- Cotton duck
- Broadcloth

Yarn Preparation Area:
- Raw wool
- Synthetic staple

Recommended for Shops with Limited Resources

	Expendable Supplies	*Approx. Costs*	
6	Graph paper tablets, 8 by 8 checks per sq. in.	@ .55	3.30
6	Graph paper tablets, 4 by 4 checks per sq. in.	.55	3.30
1	Box stick charcoal		.95
2	Sets of colored pencils	1.50	3.00
2	Sets Tempera water colors	1.20	2.40
1	Box of Permanent Textile Paints		3.50
1	Dozen sheets drawing paper	.05	.60
4	Water color or cookie pans	.25	1.00
4	Red sabel brushes No. 5	.55	2.20
2	Dozen assorted dyes	.15	3.60
4	Bags of jersey loops	.50	2.00
2	Pairs of shears	.89	1.78
1	Pinking shears		5.00
4	Ready warp spools	1.20	4.80
4	Burlap feed bags	.20	.80
1	Dozen cotton rug yarn	.29	2.48
1	Dozen rayon–cotton rug yarn	.29	2.48
2	Horizontal knitting frames	.30	.60
2	13 in. circular knitting frames	1.20	2.40
2	Blue nose rug hookers	.98	1.96
1	Pencil type rug hooker		1.70
1	Bobbin winder		5.00
5	pounds 2/10 mercerized cotton	1.00	5.00
25	pounds waste chenille	.20	5.00
25	pounds waste knit strips	.25	6.25
2	pounds 4 ply knitting worsted	3.00	6.00
5	yards of white broadcloth	.50	2.50
			79.60

Equipment

3	Porcelain pans, 4, 6, 8 quarts		6.20
4	Weaving frames	.80	3.20
1	8 in. four harness table model loom		22.50
1	20 in. four harness table model loom		75.00
1	27 in. four harness foot-treadle loom		115.00
1	Warping board		6.00
1	Late model sewing machine with attachments		120.00
4	Shuttles (Swedish boat type)	2.25	9.00
			356.90
		Total	436.50

WHITTLING PROJECT—WOODCOCK

BEN HUNT

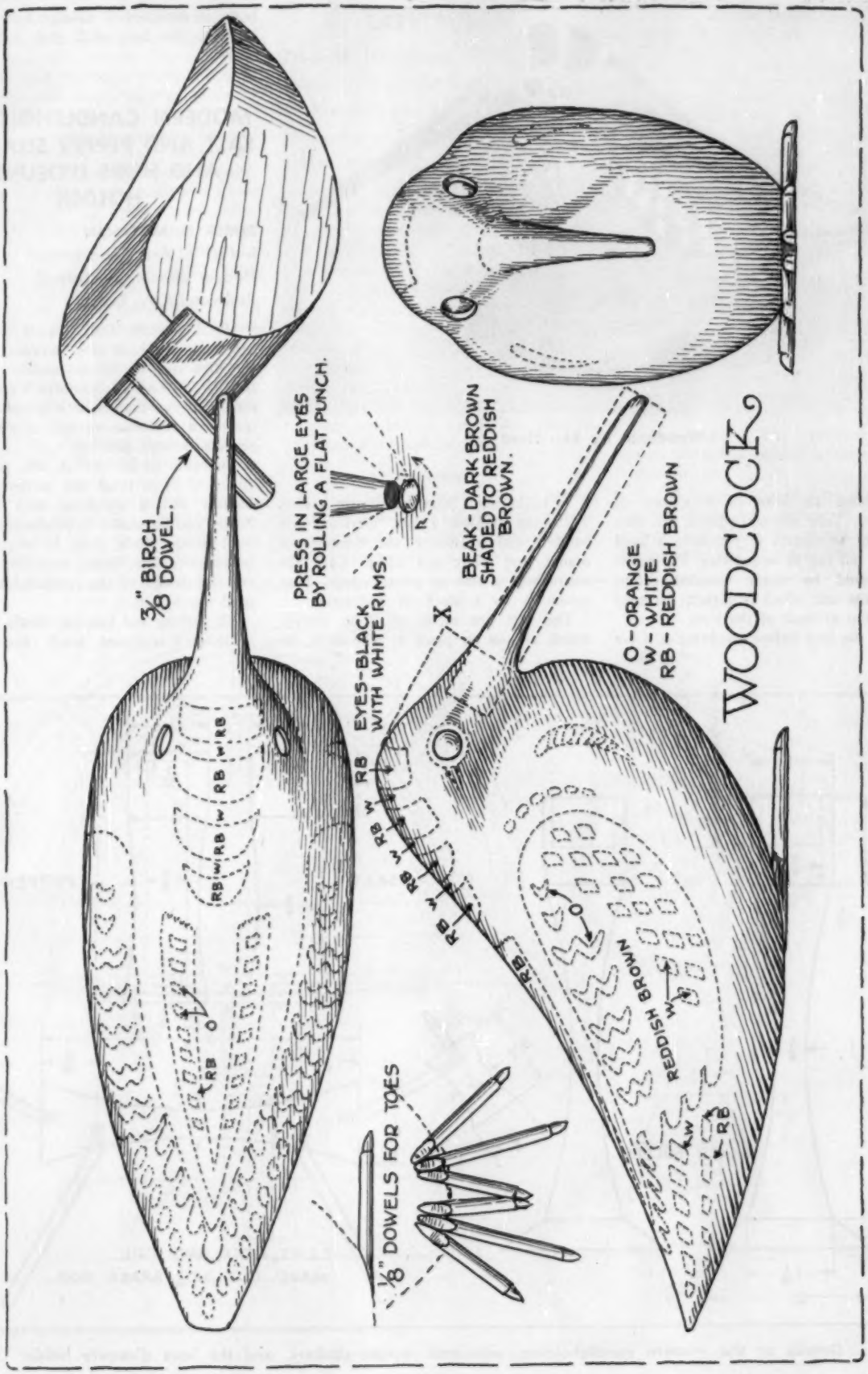
Hales Corners, Wis.

Because of numerous requests from whittlers in the United States and Canada we have decided to do a new series for your approval and, we hope, enjoyment.

We think we have some interesting "conversational" pieces coming up and trust you will think likewise.

A great many whittled objects to be described in this series are whittled out of 2-in. blocks of wood and frequently the question of 2-in. pine comes up. It seems to be rather scarce. However, since most of these things are painted, two pieces of white pine glued together will do the trick. Use Elmer's Glue-all and be sure the two pieces of wood are of the same piece, that is, the grain texture should be the same. Do not use any of the plastic cements for this because water color paints will not adhere to them, and consequently will leave a thin light line at the joints.

Start by cutting a silhouette block, but leave the piece shown at X until after the hole for the beak has been drilled. The beak is a 3/8-in. dowel in this case.


3/8" BIRCH DOWEL.
PRESS IN LARGE EYES BY ROLLING A FLAT PUNCH.
EYES-BLACK WITH WHITE RIMS.
BEAK - DARK BROWN SHADED TO REDDISH BROWN.
O - ORANGE
W - WHITE
RB - REDDISH BROWN
WOODCOCK
1/8" DOWELS FOR TOES
REDDISH BROWN

Full-size pattern for silhouette of woodcock

Woodcock by Ben Hunt

After gluing the dowel in place, saw off this point. Your silhouette block will then look like the sketch. If you have a band saw the tail can be sawed also. The whole bird should be nicely rounded except toward the tail, which is slightly flattened on the top or back of the bird.

Paint the bird before mounting it. Give it a background coat of orange cream. Then the reddish brown markings are painted, and when dry, the markings of orange and white are added. Give the entire bird a coat of plastic spray. Then mount it on a block of driftwood.

The feet are made of ⅛-in. dowels, which are set in place in glue after the body is mounted. I usually fasten these birds to the base with glue and a f.h. screw.

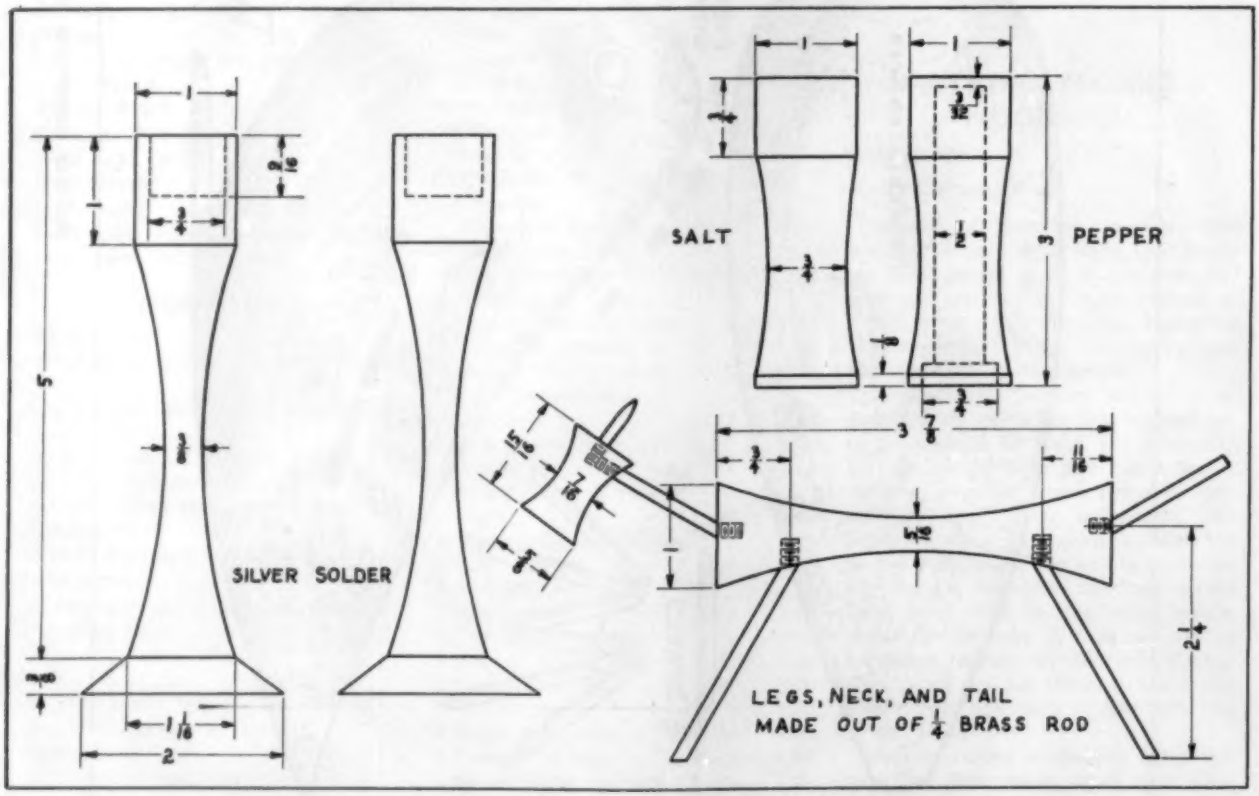
MODERN CANDLEHOLDERS, SALT AND PEPPER SHAKERS, AND HORS D'OEUVRE HOLDER

ELMER B. MATTSON
Industrial Arts Department
Hoover Elementary School
Redwood City, Calif.

Metal objects are a most requested project in a school shop; however, due to the high cost of various metals they are usually limited in number. Choosing a metal project that is both useful and requiring a minimum amount of metal presents a difficult problem.

By using 10 in. of 1-in. dia. brass and 16 in. of ¼-in. brass rod, modern candleholders and a matching hors d'oeuvre holder can be made. Candleholders are of 1-in. square stock, 5 in. in length. Body of horse is 1-in. brass, basically carrying out the design of the candleholder. Radii used was 5¾ in.

All drilling and tapping should be done while stock is square; much time and ma-



Details of the modern candleholders, salt and pepper shakers, and the hors d'oeuvre holder

terial is thus saved. Drilling of holes on the horse's body to receive toothpicks was done with a No. 32 drill. The two front holes and two rear holes are drilled at 60 deg. Great care should be used to center punch all holes.

General shaping of candleholder and horse is best done by band sawing and using the end of the belt sander, or careful filing. Beveling of the candleholder base was done on the belt sander, using safety shield and water for frequent coolings. The base is fastened onto the holder by silver soldering and filing off of the excess solder to make a clean joint.

Bending the horse's neck and legs to the desired angles is accomplished by applying heat and pressure. Leveling of legs is best done after the final position of legs is determined, merely using electric belt sander until all four legs are the same height.

Once buffed to brilliant finish, spray the entire job with a thin coat of lacquer.

When you are touching up areas on a wall before repainting, seal the areas with a thinned coat of pure, white shellac. — *Shellac Information Bureau.*

LAZY SUSAN

PAUL G. HAUSMAN
Department of Engineering
Manufacturing Processes
University of Kansas
Lawrence, Kans.

To give that extra touch of smartness when you entertain, set this lazy susan in the center of your dining room table. It is made of wood and plastic with various color combinations. The eight plastic trays rotate freely on a colorless Plexiglas rod spindle mounted into a beautifully turned maple base. The base may be turned to any desirable shape; the kind of wood used will depend on the colors used in the plastic trays. This project includes many operations, such as layout, sawing, hot forming, machining, cementing, sanding, polishing, and wood turning.

Procedure

1. Turn base in wood lathe to desired shape. Drill hole for spindle. Felt may be glued to bottom of base. Finish may be applied as desired.

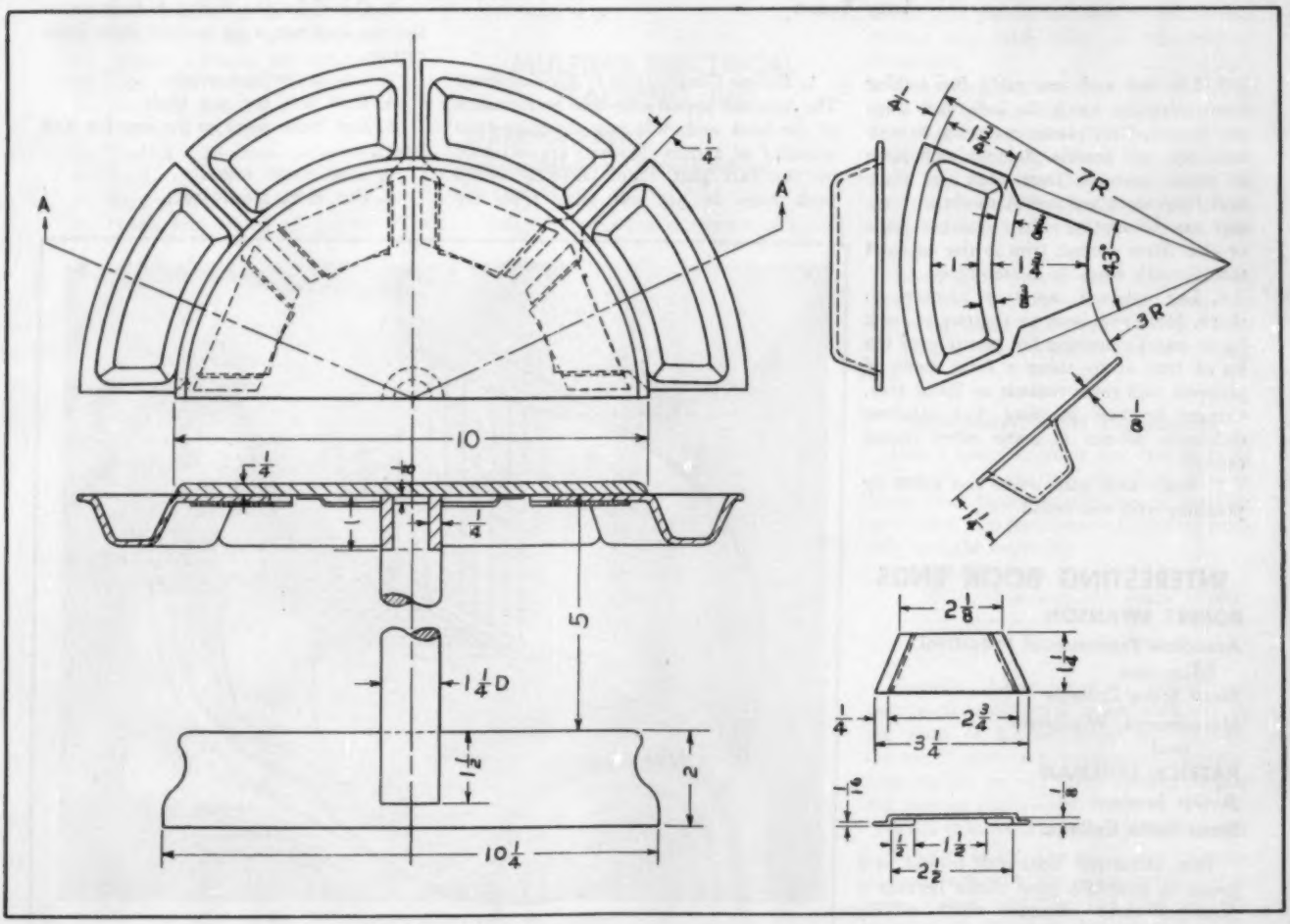
BILL OF MATERIALS

Quan.	Name of Part	Material	Size
1	Base	Maple	2½ x 10⅜ x 10⅜ in.
1	Spindle	Plastic	1¼ dia. x 6½ in.
1	Sleeve	Plastic	1¼ O.D. x 1 I.D. x 1 in.
1	Center tray	Plastic	¼ x 9½ in.
8	Individual trays	Plastic	⅛ x 4 x 6 in.
8	Tray holders	Plastic	1/16 x 1 x 3½ in.

2. Cut spindle to length, machine one end to fit inside of sleeve.

3. Lay out and saw center plate of tray. Finish edges by filing and sanding out saw marks using 100 grit wet or dry abrasive paper, followed by buffing on a cloth buffing wheel using 500 grit pumice or chalk in paste form. CAUTION: Use a very light pressure when buffing; cellulose acetate plastic will soften quickly if heated by too much friction.

4. Cut sleeve to length from plastic tubing and cement to underside of the center of tray plate. This sleeve should turn freely on machined end of the spindle.



Details of the lazy susan

Lazy Susan

5. Lay out and saw parts for making form blocks in which the individual trays are formed. Heat plastic materials in oven until soft and flexible. Remove each piece of plastic material from oven and place over form block and press into shape. Pressure can be applied either by arbor press or vise. After cooling, trim to size on band saw. Smooth edges as in step three.

6. Lay out and saw tray brackets to shape. Heat and form to contour of back lip of tray by pressing hot plastic over the lip of tray or by using a form made of plywood with same contour as lip of tray. Cement brackets in place with ethelene dichloride solvent or some other plastic cement.

7. Wash with soap water and finish by polishing with wax polish.

INTERESTING BOOK ENDS

ROBERT SWANSON
Associate Professor of Industrial Education
Stout State College
Menomonie, Wisconsin
and
PATRICK SPIELMAN
Junior Student
Stout State College

This attractive book-end project will prove an especially good choice because it possesses three elements which quickly capture student interest and assure maximum student effort throughout:

1. *Unique Construction Is Eye-Catching:* The unusual appearance and performance of the book ends will gain the immediate attention of a class. Students are intrigued by the fact that these perfectly round book ends do not roll away from the books but, because of concealed lead weights, exert constant pressure to keep the books in place.

2. *Variety Enhances Interest:* The book ends furnish experience in the fields of wood, metal, leather, and finishing. Each student has an opportunity to try out the unusual woodworking technique of using fly cutters to shape the disks. The lead insert gives him a chance to mold, a basic operation in the metals' area. In addition, he has experience in cutting and gluing leather, as well as in selecting and applying an attractive finish of his choice.

3. *Intermediate Goals Are Valuable:* Instead of lengthy, monotonous work in only one interest area, students enjoy brief, intensive effort in four fields. Completion of work in each interest area represents a short-term, easily attainable goal, an arrangement which motivates students and provides satisfaction of accomplishment as they progress from one interest area to the next.

Directions for constructing the book ends shown in Figure 1 are as follows:

1. Select stock. ¼-in. fir plywood for inner disks; walnut or mahogany plywood for face disks. See Figure 4 for dimensions.
2. Cut disks. See Figure 2. It is necessary to construct a jig to hold disks while cutting.
3. Layout for lead weight.
4. Drill hole for saw blade.
5. Saw inner disks on jig saw for lead insert.
6. Sand rough edges.
7. Cut ¼-in. plastic rod.

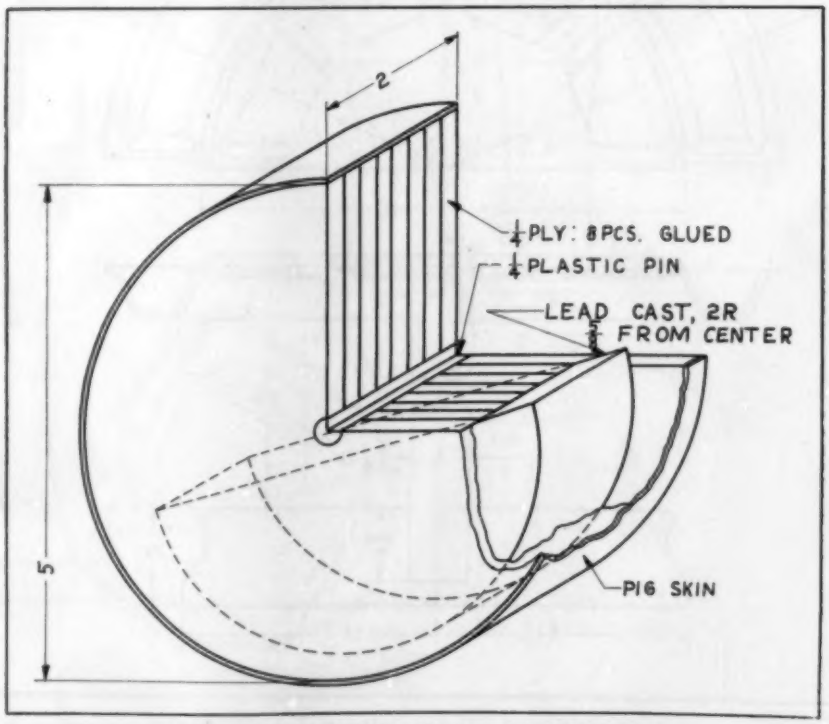


Fig. 4. Detail drawing of the book-end project

Fig. 1. Book ends combining four areas of work

Fig. 3. Pouring the concealed lead weight

8. Insert rod and glue one face to inner disks. Allow glue to dry.
9. Melt lead.
10. Pour lead. See Figure 3.
11. Allow to cool.
12. Glue other face to inner disks.
13. Sand plastic-pin level to faces.
14. Prepare surfaces for finishing.
15. Stain with natural stain.
16. Fill with paste filler.
17. Shellac, 1 lb. cut.
18. Varnish with short oil varnish.
19. Sand.
20. Repeat steps 18 and 19.
21. Polish with lemon oil polish.
22. Select 4-oz. pigskin.
23. Cut to rough dimensions, 16 by 2½ in.
24. Glue to edge of book end.
25. Allow glue to dry.
26. Trim edges.

Fig. 2. Cutting disks with fly cutter

Photographs, Stout State College, Menomonie, Wis.

MULTIPLE ELECTRICAL TEACHING AID

CLARENCE PARRY
Shenendehowa Central School
Elnora, N. Y.

This aid fits basic requirements of a good teaching aid as it can be used in many demonstrations and related lessons. It can be used to show meter hookup, Ohm's law, watt-hour meter, electrical mathematics, switches and controls, characteristics of series and parallel circuits, series/parallel wiring, and many other electrical-theory situations.

The selling point of this board lies in the fact that people like to pull switches to see what will happen. This aid is readily adaptable for student use in *experiment type* and question-and-answer units. It has a definite follow-up of putting objectives across in a dynamic meaningful lesson.

Information sheets and units can be worked up by the instructor along the following topics as a guide. They also help to illustrate the versatility of this teaching aid.

Information Sheet Suggestions

Ohm's Law: In using any two parts of a formula we can find the third. We already start to see possibilities of carrying on further into electrical mathematics from this versatile beginning.

$$\text{Intensity (Amps)} = \frac{\text{Electromotive Force (Volts)}}{\text{Resistance (Ohm's)}}$$

Electrical Power (Watts): We all use and purchase electrical power each day in the form of kilowatt-hours and through the use of ammeters, voltmeters, and watt-hour meters we can teach reading meters and figuring cost of electricity.

Watts (Electric Power) = Volts X Amps

Series Circuits: The aid is used to demonstrate and show the characteristics of a series circuit and the fact that all resistances are interdependent on each other in a series circuit.

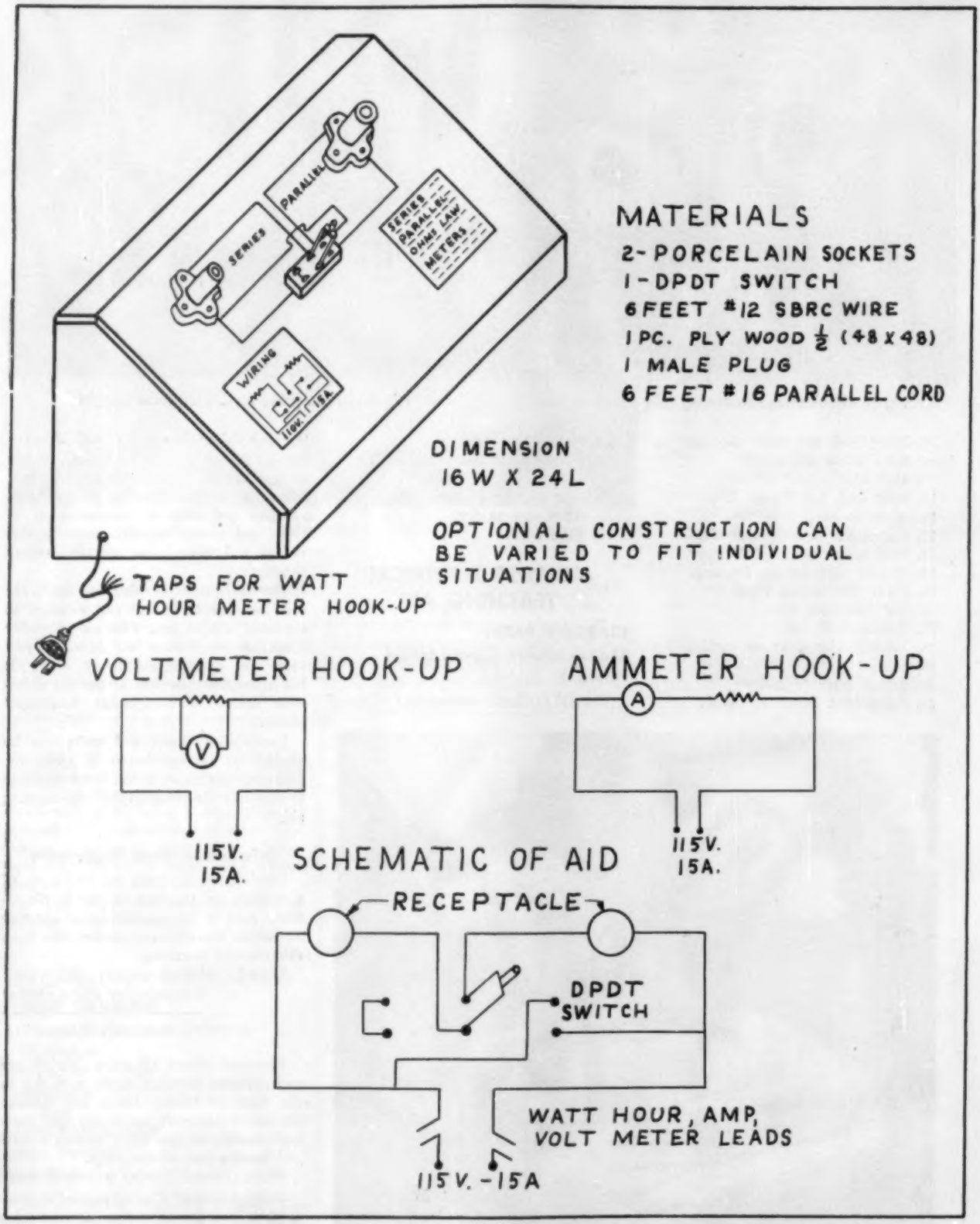


Fig. 1. Construction details of the multiple electrical teaching aid by Clarence Parry

1. Current in a series circuit is the same in all parts.
2. Voltage of a series circuit is the sum of the voltages across each individual resistance.
3. If one resistance is varied in a series circuit, it will vary the amperage of the entire circuit.
4. Varied resistances will vary voltages across each resistance.

Parallel Circuits: The aid demonstrates and shows the characteristics of a parallel circuit and the fact that each resistance is independent of each other.

1. The current of a parallel circuit is the sum of the amperages across each individual resistance.
2. Voltage remains the same in all parts of a parallel circuit; it is constant and equal across each resistance.
3. If resistances are varied the voltage still remains equal and the same in any part of the circuit.
4. Varied resistance will, however, cause the amperage to change across each individual resistance.

Meters: The use of meters in electrical circuits, their respective readings and what they tell us about the circuit.

Ammeter: Hooked in series with an electrical circuit. Meter construction, theory and operation.

Voltmeter: Hooked in parallel with an electrical circuit. Construction and theory of operation.

Multi Meter: Versatility and use in many circuits.

Watt-Hour Meter: Reading and hookup to service entrance. Figuring cost of electrical bills each month.

EXAMPLES: Use a 25-w. and a 75-w. bulb and allow to operate for a sufficient time taking readings before and after operation. Using a rate sheet, figure the cost of operation for the period of time the lights were used. An attachment plug can be screwed into a receptacle and a high resistance plugged in to show what a resistance type of appliance will draw as compared to light bulbs on the Watt-Hour Meter.

Switches: Although a DPDT switch is used on this board, it can help to illustrate the different ways switches can control a number of circuits and open up topics available on the numerous-type switches.

The preceding examples are only a few of many possible uses of this teaching aid and will suggest many more to you as you study and use it in your teaching. The simplicity and yet variety of uses make it most worthwhile to the student and instructor as a means of learning through doing. An instructor can easily develop instruction and information sheets to correlate with the aid. They can in turn be used as project work in high school classes.

Construction

1. Smooth and square wood to required dimensions.
2. Locate and fasten sockets and switches in position. See Figure 1.
3. Wire as shown in schematic drawing.
4. Cement typed information sheets to board.
5. Shellac and wax entire board to protect it from wear and for the sake of appearance.

NOTE: These are only general steps of construction as it is quite possible that you might want to incorporate this unit in your present test panels.

The general purpose of a teaching aid must be versatile in its use to warrant construction and use in industrial-arts classes. A *teaching aid* that can be utilized in a number of teaching situations is an excellent criteria for judging its value as an aid. Furthermore, a good aid enables a student to see and learn something difficult in a clear manner, e.g., series/parallel circuits.

REINDEER CANDLEHOLDER

CHESTER E. VONSAVAGE
Edwardsville High School
Kingston, Pa.

In our school district there are few raw materials supplied. Those supplied are used for assembling.

Large Crisco and Spry cans are the chief source of supply of sheet metal from which small projects are made. The tops and bottoms are used in art metal. They can be formed into small receptacles and useful articles. Wire coat hangers also are used.

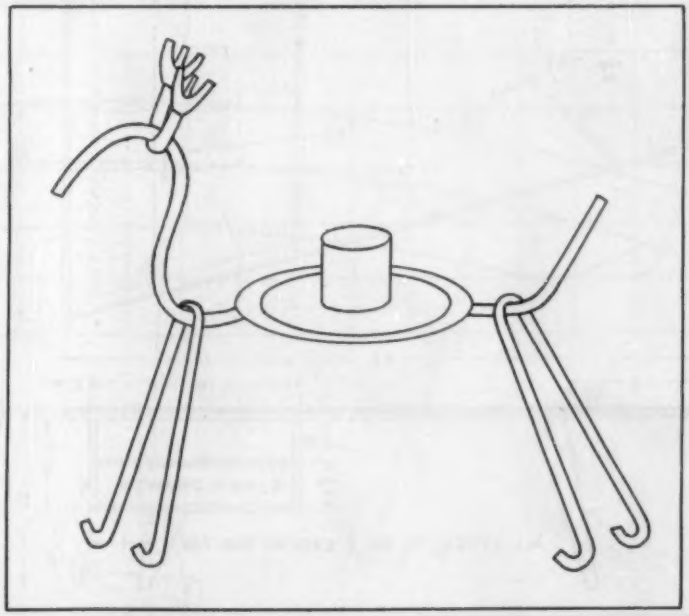
The following is a coat-hanger and tin-can combination. This project can be combined and used with the sleigh that was in this magazine earlier in the year.

Materials: Two coat hangers; one soup can; and acid core solder.

Procedure:

1. Cut off the top of the can so that there will be no sharp edges.
2. Straighten out hangers and remove paint with old sandpaper.
3. Cut one 8-in. piece of wire for the body.
4. Cut two 4-in. pieces for the legs.
5. Cut one 2-in. piece for the antlers.
6. Cut two 3½-in. pieces for the antlers.
7. Bend the wire to the desired shapes with pliers and vise.
8. Use the remaining can to make a candleholder and use a lap joint.
9. Solder the joint and then solder the holder to the can bottom.
10. Solder the holder to the body.
11. Solder the legs to the body.
12. Solder the antlers together and then to the body.
13. Wash the acid from the joints.
14. Wipe dry and paint.

One out of every six work accidents are due to falls. About 3000 persons are killed on the job every year because of falls. — *Facts About Falls.*



Reindeer candleholder made of a coat hanger and a tin can

MODERN COFFEE TABLE

JOHN W. DAWLEY
Instructor of Woodwork
San Gabriel High School
San Gabriel, Calif.

Here is a large, practical coffee table possessing interesting contemporary lines. It is suitable for advanced woodworking students with experience in the use of power tools. The joints utilized are quite simple and easy to handle.

Special Notes

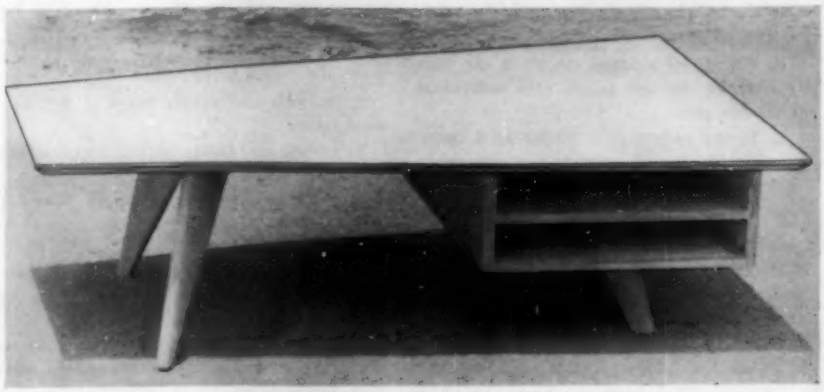
1. It is suggested that the assembly of the table top be left until the other parts are cut out and assembled.

2. The grain on parts 2 and 3 should be vertical in direction. In other words, the 6-in. dimension is in the direction of the grain.

3. The grain on part 4 should be in the direction of the 12-in. dimension. The part 4 which is the middle shelf is attached to the sides by means of a stopped dado. The lower shelf, part 4, is attached to the same sides by means of a stopped rabbet.

4. The lower shelf, part 4, can be made of plywood with an edge of good stock. This would not be true if the two-way drawer were to be eliminated.

5. The angles on the upper and lower ends of the legs are cut on the circular saw with the miter gauge set at 15 deg., and on the straight edge of the leg against the gauge.



Modern coffee table by John W. Dawley

6. The 45-deg. chamfer on the table-top edge is cut on the circular saw with an auxiliary wood fence attached to the regular ripping fence. The saw is tilted to a 45-deg. angle and extended up into this auxiliary fence. By adjusting the position of the ripping fence, the proper-size chamfer can be cut.

Bill of Material

Item No.	*Quantity*	*Size*
1	1	1 x 25 x 42 in.
2	1	¾ x 6 x 21½ in.
3	1	¾ x 6 x 18 in.
4	2	¾ x 12½ x 22½ in.
5	1	¾ x 2½ x 11½ in.
6	1	¾ x 2½ x 9¼ in.
7	2	¾ x 4 x 12¾ in.
8	2	¾ x 2½ x 6 in.
9	8	⅜-in. dia. x 1¾-in. long dowels

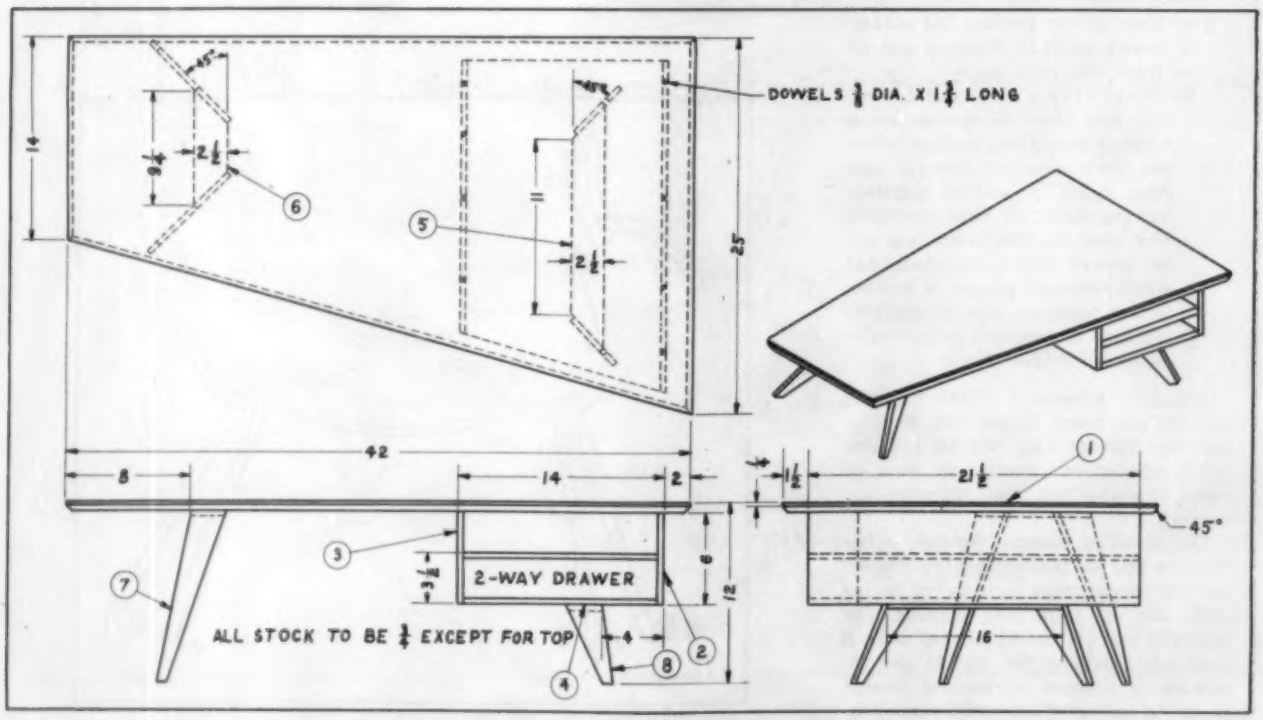
A LITTLE WATER CAN SAVE A GOOD MANY DOLLARS

FRANK P. PLOVICK
Field Service Manager
Delco-Remy Division
General Motors Corporation
Anderson, Ind.

During hot weather, insist that the serviceman check the electrolyte level in the storage battery at least every two weeks.

Unless storage battery plates are kept covered with electrolyte the battery is almost certain to be seriously damaged.

Keeping an eye on battery water during hot weather will pay off in better service and greatly increased battery life.



Detail drawing of the coffee table

LAWN CHAIR

WALDEMAR E. KLAMMER
Instructor of Woodwork
Western Michigan College
Kalamazoo, Mich.

Storage of lawn chairs when not in use is often a problem because of their bulky structure. One that can be easily taken apart and put into a single compact unit is described here. Who originated the basic idea is not known so the writer can take credit for only the revision of the design to its present form.

For storage, part *A*, which forms the seat, is removed from its position as shown in the diagram and slid inside of part *B*. The two braces marked *C* are placed on the edges of parts *B* as shown in Figure 1. Their approximate location can be seen in Figure 2. Slight variation of their placement will serve to adjust for the desired height of the seat and angle of the backrest.

The lawn chair

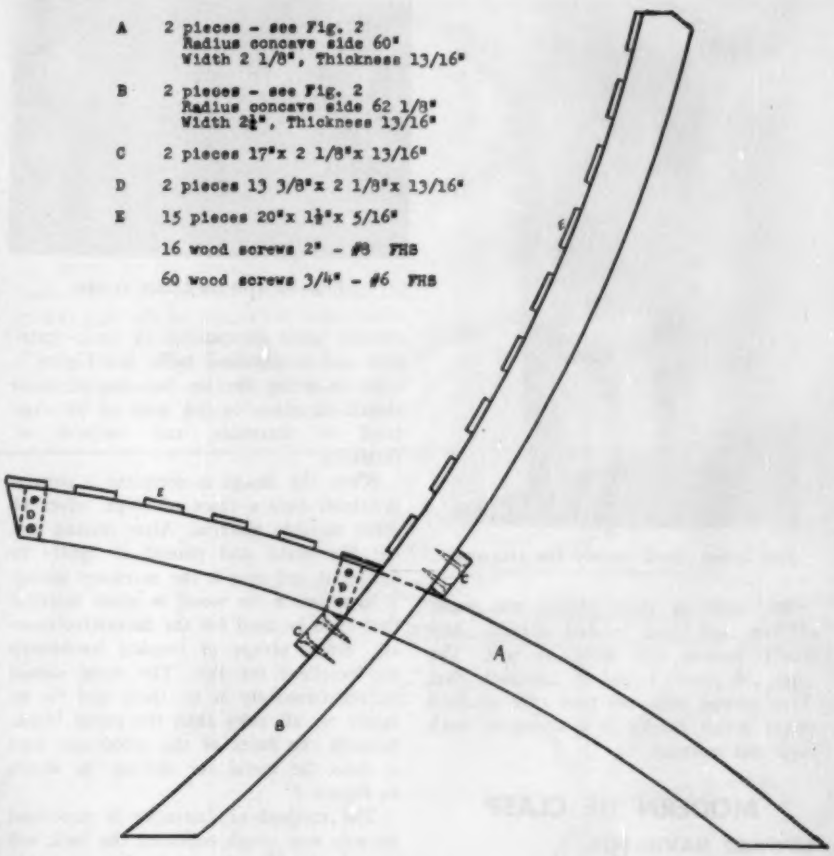

A 2 pieces – see Fig. 2
Radius concave side 60"
Width 2 1/8", Thickness 13/16"
B 2 pieces – see Fig. 2
Radius concave side 62 1/8"
Width 2¼", Thickness 13/16"
C 2 pieces 17"x 2 1/8"x 13/16"
D 2 pieces 13 3/8"x 2 1/8"x 13/16"
E 15 pieces 20"x 1½"x 5/16"
16 wood screws 2" – #8 FHS
60 wood screws 3/4" – #6 FHS
A
B

Fig. 1

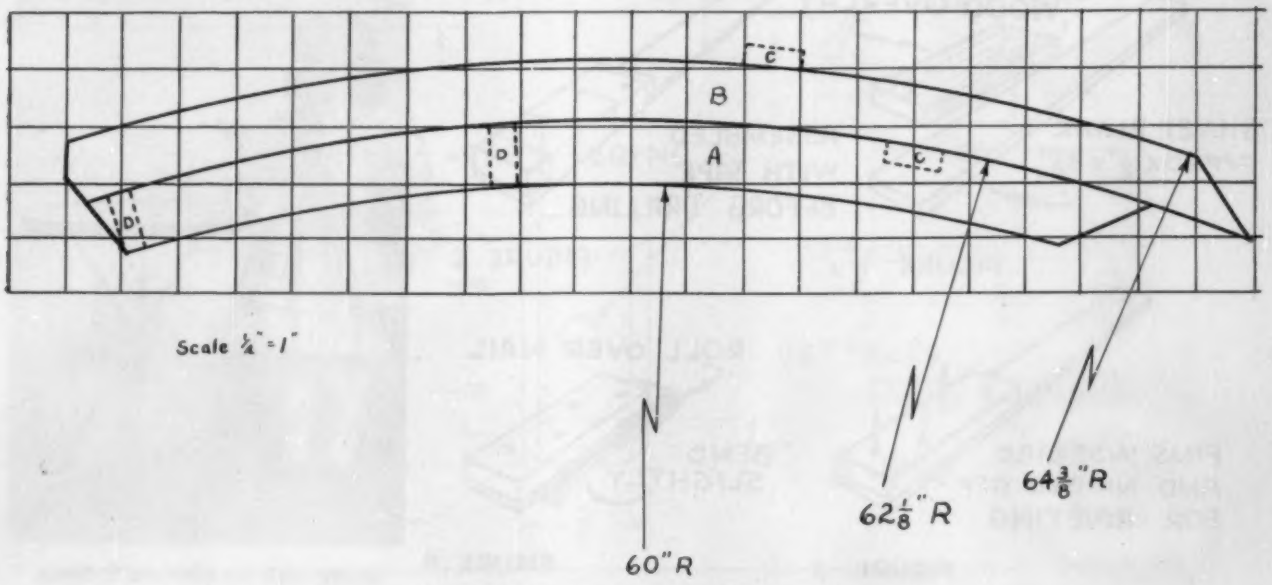
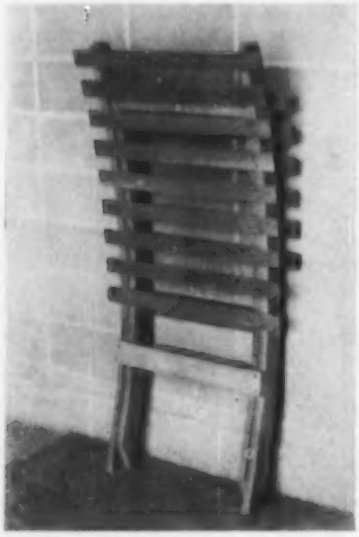


Fig. 2. Method of laying out the sides



The lawn chair ready for storage

The chair in these photos was made of 1-in. oak and finished natural. Any sturdy lumber will serve as well. The edges of parts *A* and *B* are such that three curved cuts will take care of both pieces which results in a saving of both time and material.

MODERN TIE CLASP

EDWARD DAVID FOX
Eliot Junior High School
Pasadena City Schools
Pasadena, Calif.

Here is a novel tie bar that can be constructed by the average seventh grade student using inexpensive or scrap materials and simple hand tools. See Figure 5.

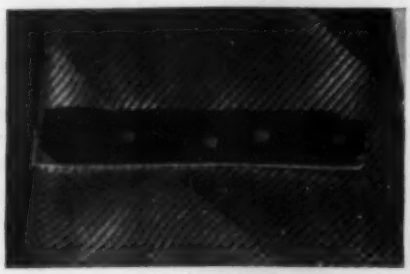


Fig. 5. The tie clasp in use

In designing the tie bar, consideration should be given to the style of tie, contrast of materials, and methods of fastening.

When the design is complete a pattern is traced onto a piece of 18-ga. silver or other suitable material. After tracing, cut out the blank and planish it lightly to harden it and give it the necessary spring.

Next select the wood or other material that is to be used for the decorative overlay. Small scraps of tropical hardwoods are excellent for this. The wood should be approximately ⅛ in. thick and 1/16 in. larger on all sides than the metal blank. Smooth the faces of the wood and tape it onto the metal for drilling, as shown in Figure 2.

The method of fastening is important because any rough edges on the back will tear the fine threads of a tie. Brass escutcheon pins are excellent because of the smooth preformed heads that make it unnecessary to do any riveting on the back. To use these pins, drill the required number of snug holes through the assembled bar and insert the pins before removing the tape. Nip the pins off closely, leaving only enough to rivet. When riveting, care must be taken so that the wood is not split. See Figure 3.

After riveting, the last two steps are apparent. First the wood is shaped by filing; next it is polished by hand rubbing. Finally the blank is bent to its finished shape over a nail or a piece of drill rod. See Figure 4.

The only limit to the design and variation of this basic pattern is the ingenuity of the student.

UTILITY TABLE

RUTHFORD E. SMUTS
North Side High School
Fort Wayne, Ind.

The utility table shown here has proved to be a very interesting project for the general metal shop. It provides something new, something modern, something that appeals to the boy and the parent alike. It can be used as a guest table for an afternoon tea. It fits up closely to the arm of a davenport or chair, where space is at a premium. It is used by small children in the rumpus room for playing house, coloring, or eating.

It appeals to the boys because of the variety of materials used and the area of work involved.

The following list of materials is suggested: ¾-in. plywood, contact glue, formica (inlaid linoleum-plastic), aluminum banding, screws, ⅜-in. mild steel bars for legs, 1½-in. diameter steel for collar, Allen setscrew, rubber tips, and flat black paint.

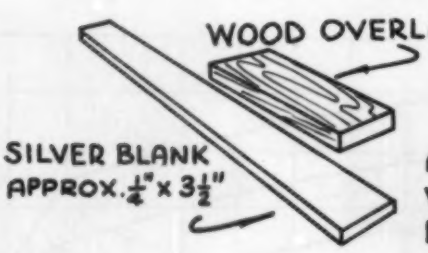


FIGURE 1

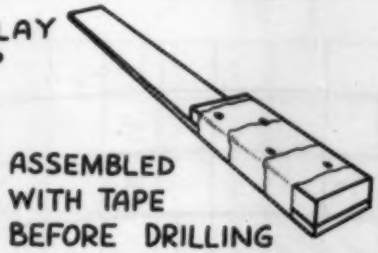


FIGURE 2

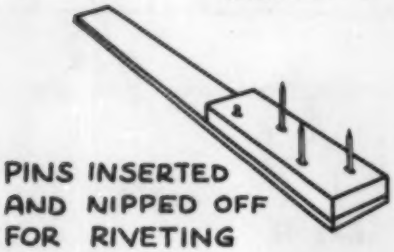


FIGURE 3

FIGURE 4

Construction details of the tie clasp

Utility table by Ruthford E. Smuts
— Masterson Studio, Fort Wayne, Ind.

It gives experience in several areas of work, such as: using the band saw; gluing; forming aluminum band and sawing it to length; forging the legs; drilling on the press; turning to diameter, facing, boring, cutting, tapping, and polishing on the engine lathe; marking and drilling a hole (V block); tapping threads for the ¼-in. — 20 Allen setscrew; assembling; and painting.

This project is within the ability range of most boys in the ninth grade and provides him with a most satisfying experience. The approximate cost is $2.50.

The Top

Suggested procedure for the top: Cut a piece of ¾-in. plywood 18 in. square. Glue the top material (inlaid linoleum, plastic, formica) to the plywood. Saw to 17½-in. diameter. Lay off the 14¼-in. circle on the bottom side and divide into three equal parts. Drill holes for the screws. Form the aluminum banding and fasten to the top.

The Legs

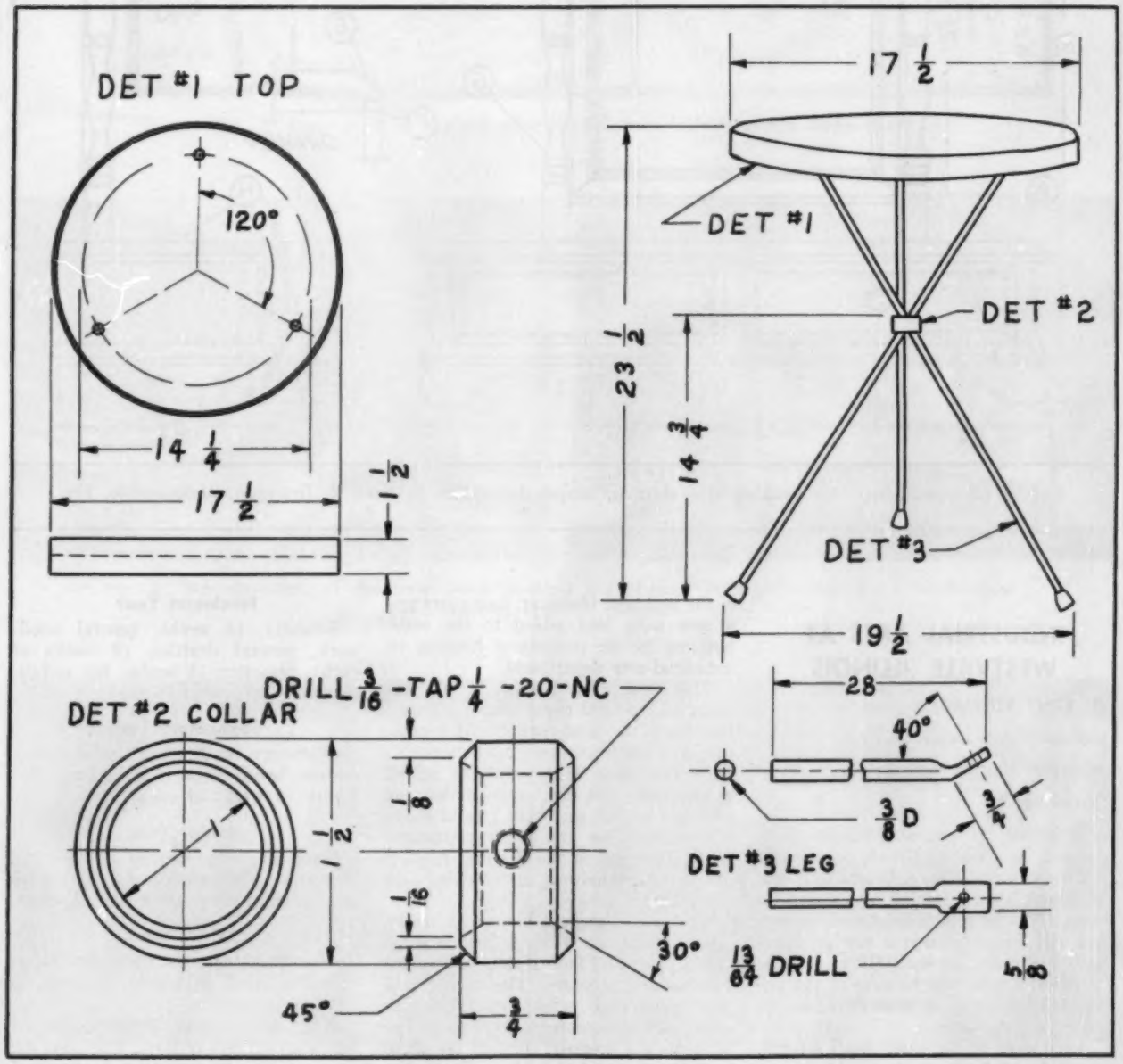
Cut three pieces of ⅜-in. diameter by 28-in. long, mild steel. Forge the top end as shown in the drawing. Drill 13/64-in. holes. Burr the bottom ends so that the rubber tips can be placed on more easily.

The Collar

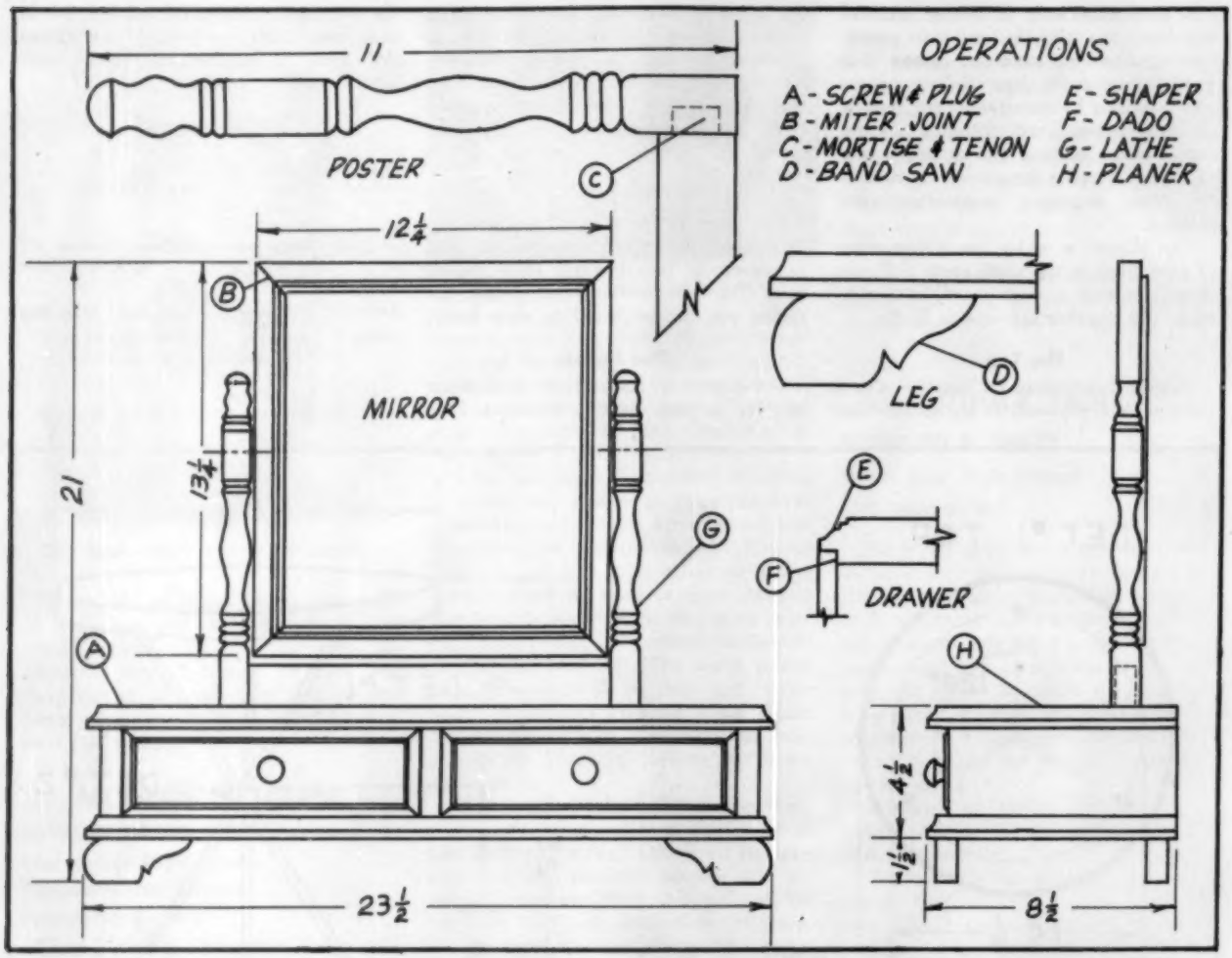
Cut a piece of stock 1½ in. in diameter by 13/16 in. long. Face to thickness. Bore the 1-in. hole. Make the 30-deg. inside taper cuts. Turn the ⅛-in. 45-deg. chamfers. Drill 5/16-in. hole and thread with ¼-in. — 20 N.C. tap.

Bill of Material

	No. of Pcs.	Material	Size
Top	1	Plywood	¾ x 18 x 18 in.
	1	Formica, and glue for same	
	1	Aluminum countertop banding	1½ in. wide by 5 ft. long, with suitable screws
Legs	3	Mild steel	⅜-in. dia. x 28 in. long
Collar	1	Mild steel	1½-in. dia. x ¾ in.
	1	Allen setscrew	¼ x ¼ in. 20 N.C.
	3	Rubber tips for the legs	
	3	Screws	R.h.b. No. 10 x ¾ in.



Construction details of the utility table



Details of construction for making the shaving stand. Submitted by Fred R. Thornton, Jacksonville, Fla.

INDUSTRIAL ARTS AT WESTVILLE, ILLINOIS

G. KENT STEWART

Industrial Arts Department

Westville High School

Westville, Ill.

Westville, a town of 4200 people is located in eastern Illinois some 130 miles south of Chicago. Westville is one of Illinois's early mining towns; but its deep mines have long since been worked out and the population is now predominantly engaged in agricultural and industrial occupations because of the numerous industries in Danville some six miles to the north.

Like most of the early small schools, the industrial-arts shop was located in a dark narrow room in a remote section of the building. However, four years ago a new wing was added to the main building for the purpose of housing an industrial-arts department.

This new wing houses the general wood and general metal shops, a finishing room, two rest rooms, and a combination storeroom and instructors' office. The shop wing joins the school gymnasium and the area under the bleacher section serves as a band room, a drafting room, and as an instructors' office. Included in the drafting room is also a small woodwork and drafting supply room.

The shop program comprises industrial arts only as Westville has no vocational trade and industrial or diversified occupations program. The school is a four year high school with all four years well represented in the shops. The students are revolved through the shops under a shop rotation plan. The industrial-arts program is outlined as follows:

Freshman Year

Semester, 18 weeks: general woodwork, general drafting (9 weeks of each). Semester, 18 weeks: hot metals, electricity, art metal (6 weeks of each).

Sophomore Year

Semester: drafting (18 weeks). Semester: bench metal with welding, electricity (9 weeks of each).

Junior Year

Semester: woodworking (18 weeks). Semester: adv. bench metal with welding, machine shop (9 weeks of each).

Senior Year

Student chooses the shop area, either metal or wood in which to spend his total senior year.

The shop classes at Westville are made up entirely of boys. The class size ranges from 12 to 22 students. Each of the two instructors teaches five hours

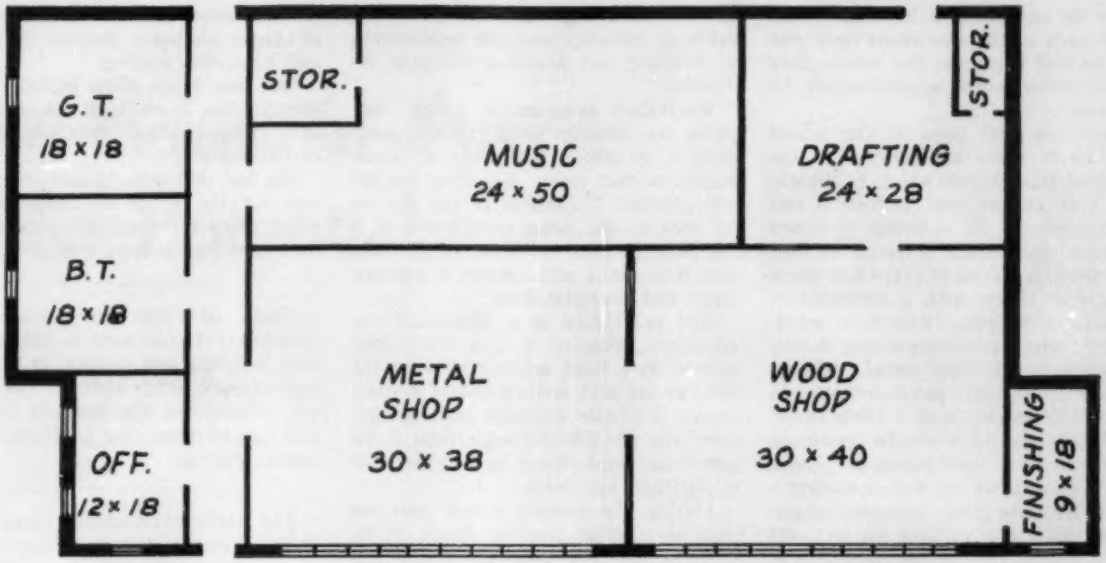


Fig. 1. Floor plan of the Westville High School Industrial-Arts Department

Fig. 2. An elevation of the new wing housing the shops. At right – Fig. 3. A sophomore drafting class in progress

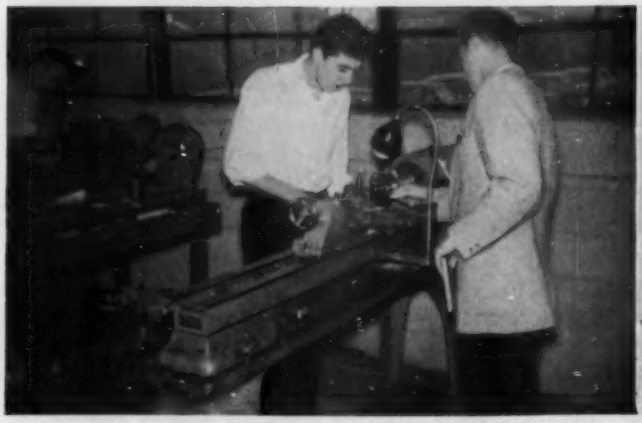


Fig. 4. The metalwork instructor, Mr. Shimp, aids a student with a turning problem. At right – Fig. 5. Students at work in the wood shop

of the six and one-half hour day. This leaves each of the two shops open one and one-half hours per day which gives a shop utilization of approximately 80 per cent.

There are 160 boys in the school and 130 of them are enrolled in the industrial-arts classes which is slightly more than 80 per cent. Industrial arts is required of all entering freshmen and with our present program as outlined above if a student takes four years of shop he leaves with a minimum of 27 weeks of drafting, 27 weeks of woodwork, 33 weeks of metalworking including bench metal, sheet metal, welding, machine shop, and some forging, 15 weeks of electricity, and 6 weeks of art metal, plus the 36 weeks he spends in his chosen shop area during his senior year. Although we are not operating a vocational-trade and industrial-education program we do accept the fact that the two fields do overlap considerably and that our graduates do leave with a moderately broad understanding of the woodworking and metalworking fields of industry and the relationship of drafting and planning to these industries.

Westville's program is young, but plans are already being made to expand it to take in the areas of transportation and crafts including leather and plastics. Expansion of the electrical area is also being considered. It is the plan to take over the band room (see floor plan) and convert it into our crafts and electrical shop.

The possibility of a diversified occupations program is also being considered as a joint activity between the commercial and industrial-arts departments. Westville, although small in size, does offer considerable opportunities for part-time employment in a variety of occupations and fields.

During the coming school year we plan to conduct evening classes in industrial arts. We could not handle apprentice training or trade extension in woodwork or metalwork because of limited equipment. However, these types of classes are being planned in drafting and blueprint reading.

Our long range plans include a separate building in which an auto mechanics and transportation program may be carried on.

We feel that through our program we can aid the youth of today to take their place as productive citizens in tomorrow's technological society.

Chalk drawings are popular with youngsters. If you want to preserve one, dust it lightly and cover with a thinned coat of pure, white shellac. The shellac will also stiffen the drawing paper to make easier mounting. — *Shellac Information Bureau.*

The battle of Wounded Knee Creek, S. Dak., ended all Indian Wars for the United States, on December 29, 1890. — *Wisconsin Military District.*

The projects shown in this picture at the left, are made of copper, brass, and enameled copper. The projects in the right-hand photograph are made of pewter.

These art metalwork projects were made by students in the Industrial Arts Division of Wisconsin State College, Platteville, Wis. Emerson Wm. Manzer is the instructor.

Since there has been a growing interest in this work, a 1957 summer session course in art metal was conducted at the college for six weeks. The course included metal enameling, metal spinning, the formation of projects by the hand-wrought method, and the various soldering processes used in making metal projects

— Photographs, Virtue Studio, Platteville, Wis.

The Industrial-Arts Shop Potential

ALEXANDER F. BICK
Teacher in Milwaukee Schools
The Milwaukee Downer College
Milwaukee, Wis.

This article restates from another angle the case for broader objectives in industrial arts. It also reports on an eighth-grade experiment mentioned in an earlier article.

From the standpoint of the present national need and of the state of the public mind, a re-evaluation of the obligation of industrial arts indicates with increasing clarity that the potential of the department is far beyond the present concept.

Examination of the field of needed public knowledge on the level at which the school shop is particularly apt, shows that citizens generally are not given important information, contacts, and experiences that clear up common misunderstandings. For example: the ordinary facts of familiar engineering are not known to the general public. More important still, present industrial problems of finance, costs, production, sales, the use of new materials, and especially the present need for industrial economies to combat stiff competitive marketing, are not now available to the people in a way that they can comprehend. The fact is, much needed knowledge of this and similar sorts are hidden in the archives and practices of specialized groups and college departments, from which only fragmentary knowledge reaches the public to more confuse it. Such misunderstandings are the cause of suspicions, prejudices, unfounded opinions, hatred, and these induce monetary losses which cost the nation's economy and the people individually fabulous sums annually.

Industrial arts is the only department of education equipped to provide this needed understanding to the public.

In comparison, the department's present emphasis on skills is a small area in the need. I am sure, the waste in the skills approach must soon be fully comprehended and changed. The need beyond skills is too great, especially so when skills may be taught with more force and reason as the means to understanding the greater concepts of national life. Such use of skills has proved itself conclusively in the project to be reviewed in this article. The outcome of the experiment, in terms of student attitude and broader viewpoint, is impressive.

An added outcome is this: at the conclusion of the experiences mentioned, it is plain that much must be done to fit teacher trainees with broader outlook and wider usefulness. When training leans so heavily on mechanical considerations, processes, concepts, tests, information, and evaluative method, and so little on the inner life of the student and his boundless potential, work on the shop floor cannot be expected to be more than skills training in an almost purely vocational bracket. This result is not by intent but by method. Furthermore, the actual shop procedure, almost without exception, is skills training and little more, despite theory, despite written aims, meetings, leadership and convention oratory, and the vague objectives of the teacher. The shop system and its subject matter is vocational by nature. Yet, skills are a small portion of the need today. Even industry, in its recommendations to the industrial-arts department seldom mentions skills, but rather "attitudes," "character," etc.; matters that refer to the inner purposes of the student.

The Junior Achievement movement fills one of the important national needs. Industrial arts might well fill that need in a direct service to the general public, but it is not ready to do so. In thus proceeding independently, the Junior Achievement criticism of industrial arts could hardly be more eloquent.

That the industrial-arts department is able to handle broader assignments is proved by the projects attempted here, and now at the selling stage. The grade level, as mentioned, is the eighth in a junior high school program. The boys in the class in question had had a semester each of wood, metals, electricity, and they had had experience with Castolite casting plastic during woodwork.

They were told at the end of the seventh semester that the eighth semester was to be given to an entirely new experience. The reasons: Youth today is accustomed, by way of television, radio, movies, and their inane comic literature, to quick climaxes. Unnecessary detail is therein eliminated; in fact, it recedes to an inarticulate background. This is true also of recreation and conversation.

Youth thus is trained to *get the point* quickly, and children are able to do this, even when the program is on an adult level.

In this state, they come to school where detail is drawn and spelled out. In school shops, as an example, they are subjected to such *killing* subjects as *time fillers*. These *do something* to the student as well as to the public respect for the industrial-arts department. Much of this material is a waste of student time. They feel it long before the teacher is aware of it. The remaining time is difficult for both student and teacher. The students are inattentive; they play; and they become problems. One third of industrial-arts time is exploration, and the remainder is pain for some and play for others. Repetition beyond exploration hurts the purposes of industrial arts, as it is *killing* to the student. His nonco-operativeness occurs underneath his demeanor in the case of those who respect the teacher, but for the *troublemakers* it is out in the open. Teachers say, "the times have changed; children are not brought up properly." The real truth is; schools have not changed with the times. The unbending educational system must change or kill its long-suffering teachers. The system, set into the solid rock of old minds will be compelled to meet the speed and method of our time. Then will the department have time for new challenges, drawn from the unused potential of industrial arts.

The new semester began in this manner: The purpose of the new work was to teach students the problems of competitive manufacture. This includes the industrial problems of finance, of standards, of organiza-

Teaching the student the problems of competitive manufacture

tion, of supply, of meeting competition with modified processes, new materials, and production methods. It included the picture of industrial promotion and selling, in all of which the student was to be a part by experience. Therefore, the first act was the meeting of the board of directors. All students were part of the board, and of each department, as it operated.

1. The meeting of the Board of Directors: (*a*) Election of the president. (*b*) Selection of the product type, of material, and of general design. (*c*) Appointment of the manufacturing personnel. Discussion of the plan of procedure in production. (*d*) Appointment of the financial officer, the treasurer, whose duties were to sell stock, finance the operations, keep accounts, pay for labor, etc. (*e*) Setting the cost of stock at 25 cents per share, and the limit to any shareholder at 6. (*f*) Setting the remuneration for labor at a token rate of 2 cents per hour, the officers ¼ cent additional. (*g*) Selection of vice-president in charge of promotion and sales.

2. Product design and research department; second session. Vice-president in charge of research, directing; the activity took the form of drafting and the design of the product. Market demands and commodity outlets were examined in order to arrive at the category of clientele for whom to develop the commodity. The choice was between high production and a small margin, and low production and a higher margin. The latter fit our setup. The next problem was how to produce appearance of quality by the shortest route and at the lowest cost. Transparent, colored plastic areas framed in fine wood, was the solution.

3. Cutting of material in production line. Prefinishing of components, and the first stages of base casting took place in other production lines. This step required two or three sessions.

4. Various stages of production, principally the placing of design and colored

plastic over the pre-cast bottom surface. This required three sessions also.

5. Stages of finishing, in line.

6. Board meeting to discuss packaging for better selling, and to outline the selling plan. This is as the work stands today.

The small class and the length of period necessitated cutting procedure into parts, as above. In this plan, many processes rotated.

The product selected is a small desk tray with transparent colored design in plastic, resembling a stained glass window, framed in a narrow band of cherry wood, highly finished. If supplied with a small brass ring on the short side, it can be hung on a wall as a picture. The plastic is Castolite liquid, low-temperature casting plastic, with which the boys were able to produce beautiful effects.

Report on the Result

The attitude in the class changed from indifference and overfeeding to concentration and concern for the quality of the product. Discipline problems vanished, except in one instance when the president of the board dismissed a student. He was businesslike thereafter.

Skills were the concern of the students, and especially of the officers, and not so much the teacher, as before.

More skills were learned, and they were a matter of actually *delivering the goods* in the line. I would say, quality rose at least 25 per cent, if not more.

The finances of the operation were used as subject for discussion in classroom mathematics, where the home-room teacher made comparisons with industrial financing in terms of stocks, bonds, loans, interest, amortization of liabilities, etc. A shop chart was used in the classroom to show industrial organization.

Industrial standards, which involved the necessity for careful and accurate work in every detail so that the commodity came off the line with a professional touch and finish, were learned in practice. Otherwise, failure to meet the mark brought quick censure by members of the team.

Other industrial problems were outlined on charts, among them being the problem of raw material supply; parts, and assemblies to be used in final assembly: costs, profits, overhead, maintenance, departments, etc.

The rating for this type of training as against that for ordinary "shop," is high. Actually, the operation needs to be seen and experienced for the reader to realize how important are its many obvious advantages.

The plan is to follow this project with another on the Design of Our Cities, the possibilities of which few of the general public realize. Cities may be redesigned over a period of years if enough students are given the mental pattern thereto. Filling stations; parking lots; sales, material, and junk lots; ugly railroad areas; and shameful highway areas may be changed to the design of a co-ordinate plan, when enough students are given the mental picture. To build *what is to be* is the work of industrial arts. Not knowing *what is to be,* the public builds an unplanned chaos everywhere it puts its hand. One of the important needs today is education that builds constructively. No city and no temple was ever built in reasonable order or magnificence that was not visioned before a stone was laid. Building the constructive pattern of a new America is the work of industrial arts. Building a renaissance in America is the goal of industrial arts.

A TRAY OF WOOD, WIRE, AND ROPE

JAMES A. HALES
Industrial Arts Instructor
Aurora High School
Aurora, Ohio

This may be a core project, or one that may be selected for a junior high school, or for a beginning industrial arts program for boys or girls. Its beauty lies in its simplicity, good design, and provision for valuable learning experiences.

A class meeting schedule of one hour per day, five days a week would demand about five full weeks completion time for a group of ninth-grade students, including time for all necessary demonstrations.

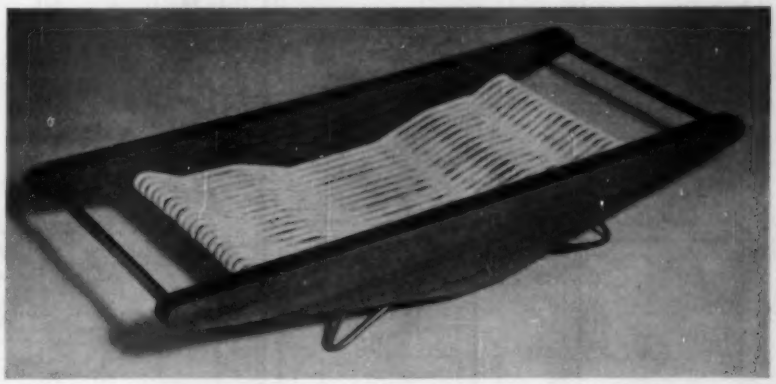
The students can expect to participate actively in class discussions, complete such operations as layout, hand and machine tool operations, gluing, clamping and finishing their projects. It is the duty of each student to take his part in the democratic organization of *his* shop.

A bill of materials might include:

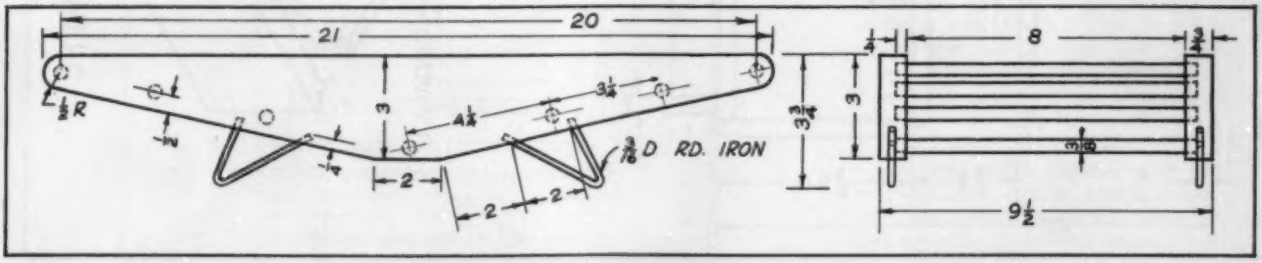
1 piece of wood, ¾ by 8 by 22 in.
1 ⅜-in. birch dowel, 60 in. long
1 $\frac{9}{16}$-in. round iron rod, 28 in. long
50 feet of ordinary clothes line

The approximate cost of this project is $1.

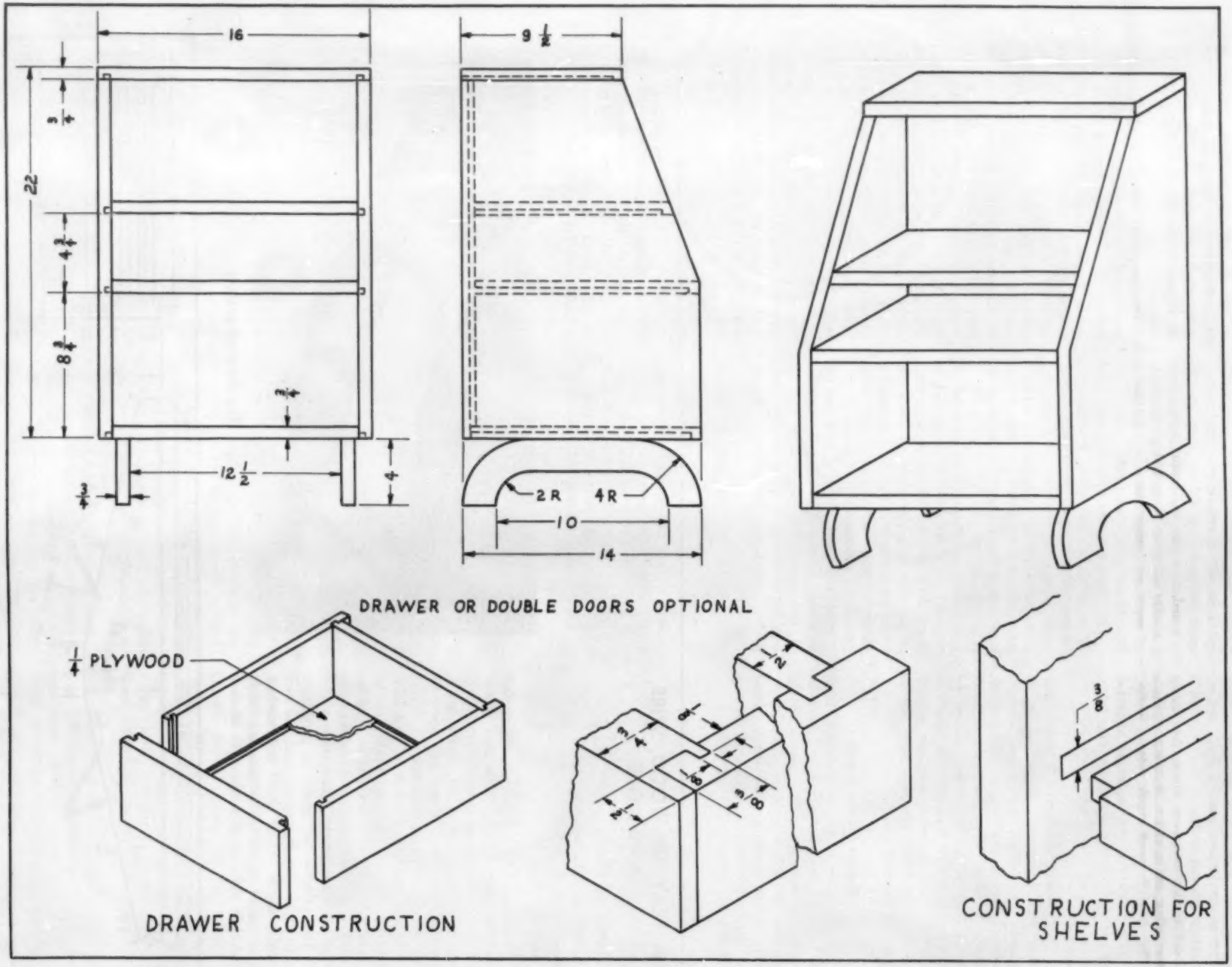
Relying on student imagination, many interesting adaptations and variations can be made from this one tray to provide valuable learning experiences.



The finished project



Details of the tray of wood, wire, and rope



Construction details, and a view of the completed night stand by T. V. Darlington, Powelton, W.· Va. Formerly at West Virginia Institute of Technology, Montgomery, W. Va.

HARDBOARD, AN EXCELLENT CRAFT MEDIUM

DICK HUTCHINSON

San Gabriel, Calif.

Few of us realize the possibilities presented to the craftsman through the use of Masonite hardboard. The richness of the texture, and the ease with which it can be worked makes it one of the most versatile of materials, particularly for the beginner. The material adapts itself so readily to the production of so many things, from the many useful, and attractive novelties illustrated here, up to many of the larger useful, and decorative pieces for the home.

The combination of the smooth surfaced, tempered hardboard, with the leatherwood, results in many beautiful pieces that require close inspection to distinguish them from real Spanish-grain leather.

We are illustrating four easy to make projects as a starter and, with a little originality, anyone can easily work out many more.

In making the pieces shown, we used both the ⅛-in. tempered, and the leatherwood. The tempered material has a smooth finish surface, while the leatherwood has a surface on one side to represent Spanish-grain leather, and pieces made from this material look very much like real leather.

Fig. 5. The finished book blocks in service, along with the smoking set

Fig. 1. Letter holder and book blocks

Fig. 3. The cigarette box with ash tray, and the finished cleaning tissue basket

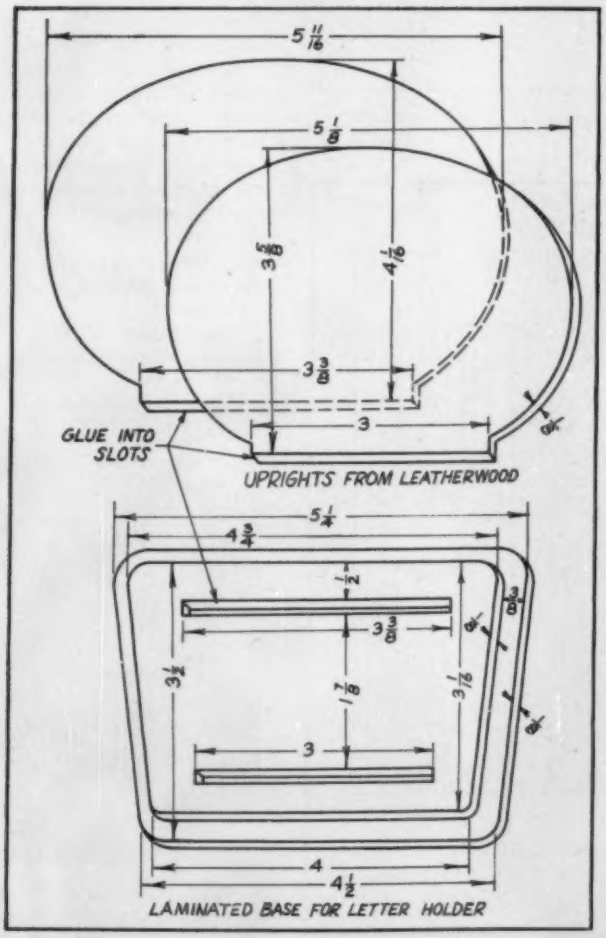


Fig. 2. Details of the letter holder

Our letter holder, Figures 1 and 2, for example, is made entirely from leatherwood. Cut the two pieces for the base, Figure 2, then drill, and using the jig saw, saw out the two slots in the top piece to receive the uprights. Apply the new white (Stainless) glue to the contact surfaces, and clamp together tight until dry. If clamps are not available, place a piece of board on either side and clamp the whole in the vise.

The two oval uprights, Figure 2, are cut from leatherwood. The edges are sanded smooth, after which they are glued into the slots in the base, the larger one in back, with the leatherwood surface facing front.

The little cleaning tissue basket (for a lady's dressing table) is also made from leatherwood. See Figures 3 and 4. Tilt the bench saw and cut the two edges of each of the four side pieces to a 45-deg. bevel, as shown in the drawing. Drill the holes, as shown, and lace the four sides together with soft leather thongs. Cut the bottom from ⅜-in. plywood, set in and secure with No. 4 by ½ in. r.h. wood screws. It is a nice piece, and will please any lady.

The book blocks, Figures 5 and 6, are very attractive, and are heavy enough to keep your books in order. These book ends are made up in three separate blocks for each book block — two sets for each pair. Cut the material slightly oversize.

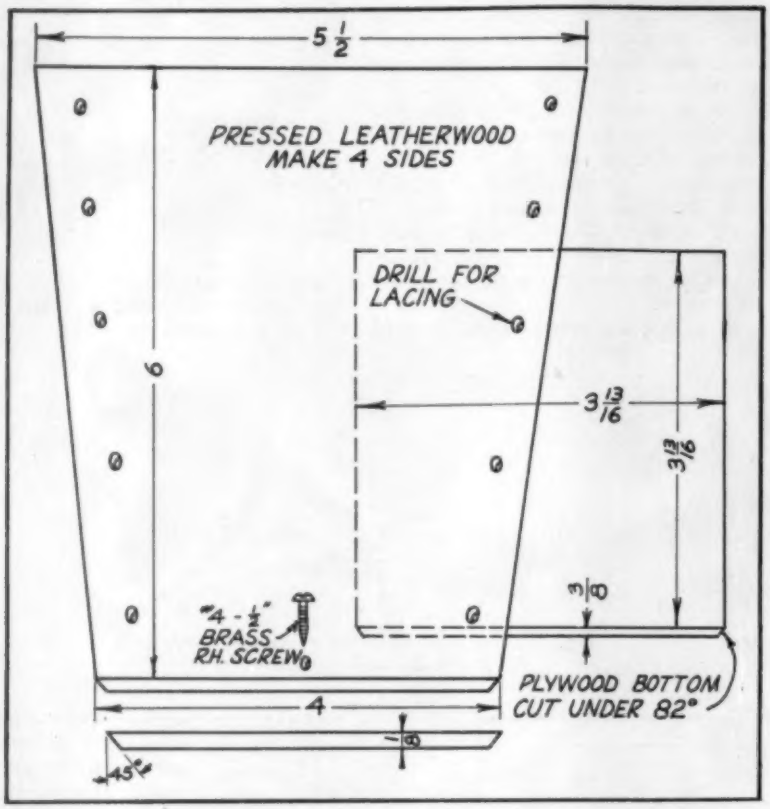


Fig. 4. Cleaning tissue basket

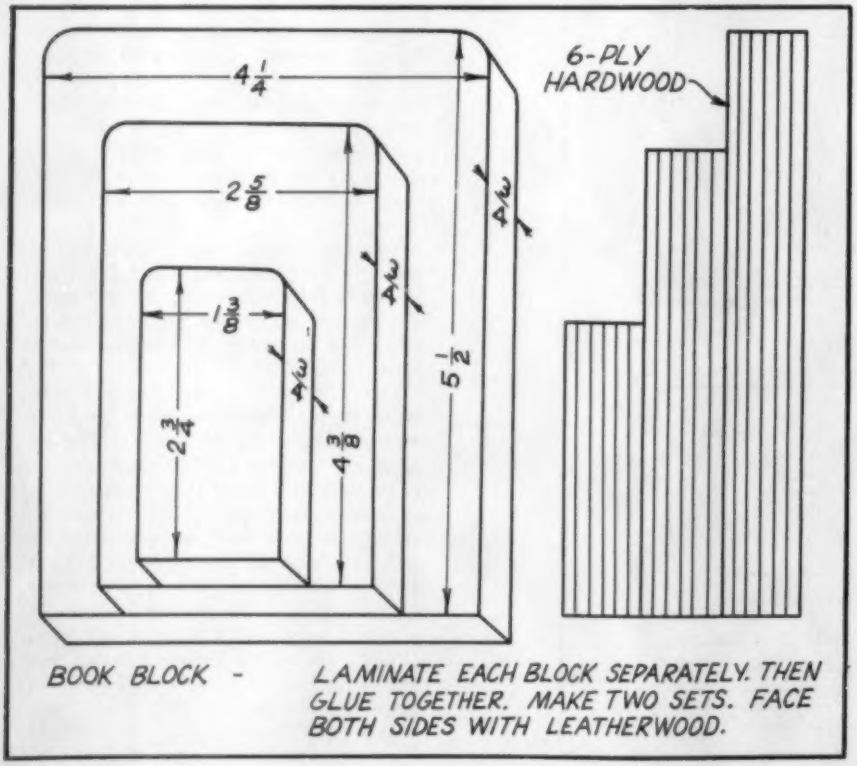


Fig. 6. Book block

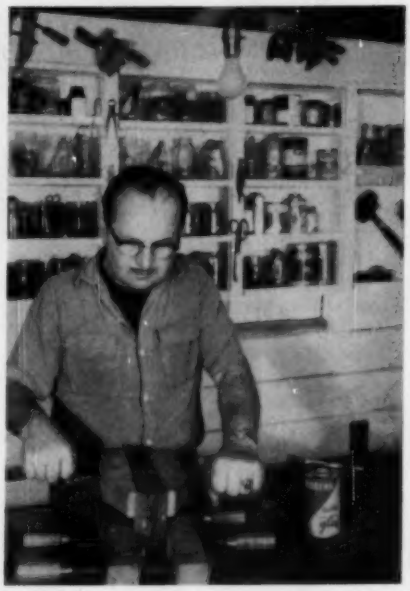


Fig. 7. Clamp the Masonite blocks together with parallel clamps until dry — about 10 hours

Five pieces of tempered hardboard, and one piece of leatherwood for each block. Glue together with the leatherwood for the outside. Clamp each separate block tight for drying. See Figure 7. Or set in the vise, between two wood boards.

When dry, saw to sizes shown, and sand the edges smooth, breaking the corners, slightly rounding with fine sandpaper. Then apply the stainless glue to contact surfaces and assemble each book block, as shown, and then clamp to dry for at least 10 hours.

The cigarette set, Figures 8 and 9, is glued up in much the same manner as the

Fig. 10. Using the jigsaw for sawing out the separate ⅛-in. Masonite pieces for the cigarette box

previous projects. First, cut and glue the six pieces together to form the box. These from tempered material, and clamp to dry. Next, cut leatherwood for the top piece of the base. Glue, and clamp the box to this, as shown. Sand smooth inside, then glue this assembly to the leatherwood base.

Select a glass ash tray. A dime-store tray measuring 3⅜ in. O.D. answers the purpose very well. We made the nest for the tray from two rings of ⅛-in. leatherwood. Sand smooth, and glue in position on the base. See Figure 9.

The piece that sets down inside the box on the cover, is a piece of tempered hardboard. This is glued to the underside of the cover, which is of leatherwood.

No further finishing is required for any of these beautiful pieces. However, it will be found that if one coat of white shellac is applied, it will help resist soil, and it does not take away from the natural beauty of this type of art.

Fig. 8. The cigarette box with box cover off, and the letter holder

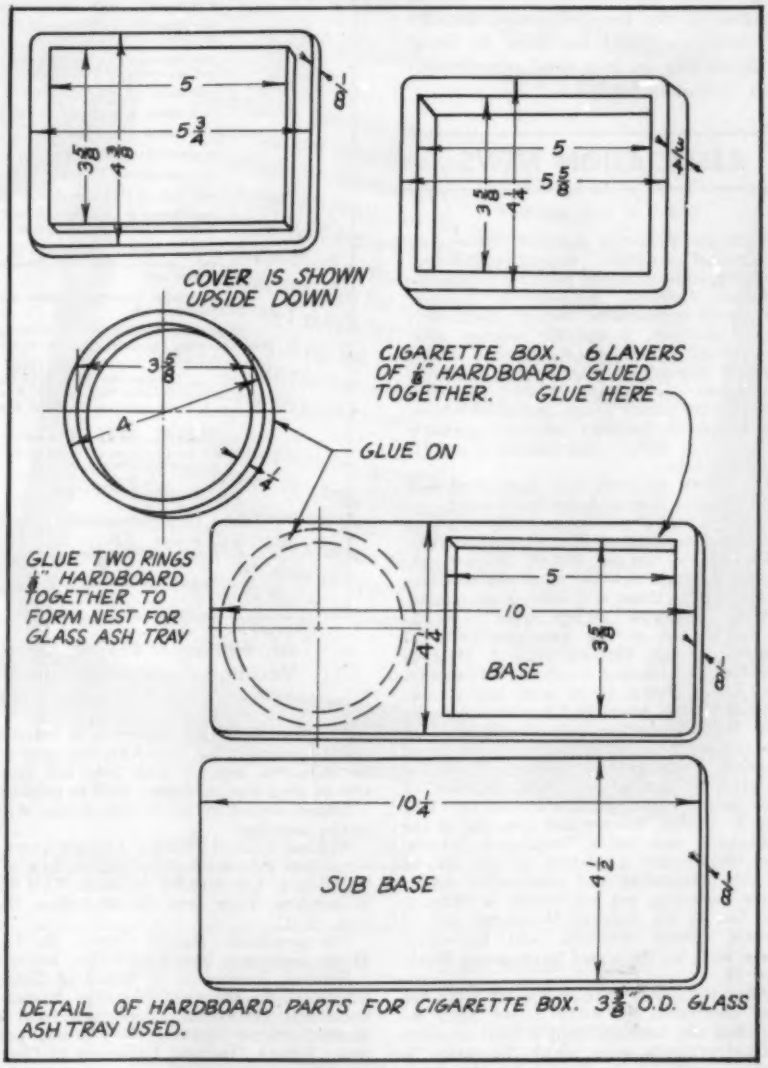


Fig. 9. The cigarette box and ash tray

INDUSTRIAL ARTS AND PUBLIC RELATIONS

D. F. CANTRELL

Head, Industrial Arts Department
High School, Grand Blanc, Mich.

Where can you find a better department for establishing good public relations than in the industrial-arts shop, where the individual carries an ideal through to reality with the help of his instructor and the industrial-arts facilities? Here the student gets the satisfaction of completing his project, takes pride in having done a good job, and can show it to his parents and friends.

Just the pride of showing his parents and friends is not enough; we, as industrial-arts teachers, should go beyond that with displays of the projects for the public to see and evaluate. If the students have done excellent work and produced winning projects, why not let the public know about it? An award could be given and knowledge of the fact could be publicized in the local paper. We need to open our eyes and examine this problem instead of saying it doesn't matter, if we intend to create an interest in other individuals for the department. All students like recognition so why not use this ambition to the department's advantage as well as the student's to increase his learning ability and make the learning situation more attractive for him.

The Ford Industrial Arts Awards Program is a wonderful step in the right direction, but there are not enough students that get to participate. The program should start at the school where all students could have an opportunity for the public to see their work and effort. After the school display the better projects could be entered in a county display where the projects could be judged for their workmanship, durability, function, and beauty. After this display the winning projects could be taken on to a district or state level where there would be more competition. The project that went to the state could be judged and the most outstanding in its particular field would then be entered in the Ford Industrial Arts Awards Program. At each of these displays the winners would get an award and recognition. All students would be

able to participate and the outstanding projects would be included in the final awards' program. The public could see each display and the many fine projects that the students have completed which required skill, ability, initiative, and craftsmanship in the making.

A program of this type would accomplish four aims in bringing the department closer to its objectives. The aims would be: all students would get to participate; all students would be given recognition; it would attract more students to the department; and it would give the public a better insight into the work of the department. If the public is aware of the possibilities of the department they will be more in favor of supporting an industrial-arts department in their school.

ASSOCIATION NEWS

(Continued from page 6A)

Trade and industrial sectional meetings on instructional materials; apprentice training; recruiting, counseling, and selecting vocational-technical students; metal-trades training; supervisory development training; radio, electronic, television, I and II; teaching aids, audio-visual lecture demonstrations; related technical instruction; graphic arts; construction trades; automotive industry-vocational education conference group; industrial laboratory technician training; industrial co-operative training; metal trades training I and II; also were held.

The Ship's program and dance was held on Thursday, August 8, in the evening.

Eva W. Scully, president of the American Vocational Association, presided at this affair.

The Ship's captain, Robert Stucker, expressed a sincere welcome of all the members of the Ship to those who were in attendance.

AVA recognition awards were given to D. N. McCarl of the American Technical Society, Chicago, Ill; and John J. Metz of The Bruce Publishing Company, Milwaukee, Wis., for attending 25 or more annual conventions of the American Vocational Association. These recognition awards were given to the recipients by Lowell A. Burkett, AVA Assistant Executive Secretary.

Harry W. Sears, the Ship's chairman of the citation committee introduced Dr. William F. Rasche, director and principal of the Milwaukee and Adult Vocational Schools. The Ship issued a citation to Dr. Rasche for his outstanding and constructive educational leadership, not only locally in Milwaukee, but in the state of Wisconsin, and in various federal situations and in educational work for the armed forces during World War II.

After the Ship's gifts to the members had been distributed the Ferko String Band entertained the audience with a most excellent musical program, after which the decks (in nautical terms) were cleared for the Ship's dance.

At the second session of the House of Delegates, it was announced that the 1958 convention would be held at Buffalo, N. Y., and the 1959 meeting at Chicago, Ill.

The dates of these meetings will be announced later.

The candidates for the presidency of the AVA are Dr. H. H. London, professor of industrial education, University of Missouri, Columbia, Mo., and president of the National Association of Industrial Teacher Educators; and William R. Mason, supervisor of industrial arts, Cleveland, Ohio, and AVA vice-president for industrial arts. A mail vote will decide who of these two candidates shall be president.

Officers elected by the various groups at the special meetings:

National Council of Local Administartors of Vocational Education and Practical Arts: Lee W. Ralston, Los Angeles, president, Tom Bell, Whitehaven, Tenn., and Harold Collins, Durham, N. C.

Vice-presidents: Harold Ostrem, St. Paul, Minn., secretary; and Ed Kotchie, treasurer.

National Association of Industrial Teacher Educators: C. Thomas Olivo, chief, bureau of vocational curriculum development and industrial teacher training, New York, president; Robert Tinkham, University of Illinois, secretary treasurer.

Industrial Arts Policy and Planning Committee. The new members added to this committee are: J. Lyman Goldsmith, Los Angeles, Calif., Verne L. Pickens, Kansas City, Mo.; Robert M. Worthington, Minnesota, assistant state supervisor of industrial education; and Athol Bailey, University of Washington, Seattle. William R. Mason, Cleveland, Ohio, continues as president of this committee, and H. H. London, University of Missouri, Columbia, continues as vice-president for 3 years.

THE SHIP
PAYS TRIBUTE TO
WILLIAM F. RASCHE
All members of THE SHIP salute you — WILLIAM F. RASCHE, distinguished son of Wisconsin — for fifty years of service to Education. During these fifty golden years you served as teacher and principal in a country school, teacher on a Milwaukee County Circuit, teacher and director in the Cudahy, Wisconsin, Vocational School, teacher at the University of Pittsburgh, teacher, supervisor, principal and director, since 1940, of the Milwaukee Vocational and Adult Schools.
You have brought recognition and honor to your profession and have contributed to the building and strengthening of the American way of life through
. . . your effective pioneering of all aspects of Vocational Education
. . . your thorough understanding of the educational needs of youth and adults, and your untiring efforts to meet those needs
. . . your leadership in achieving recognition for Vocational Education in Milwaukee, in Wisconsin, and throughout the United States
. . . your vision and understanding of the relationship of education to industry
. . . your service as chairman of the Milwaukee Metropolitan Youth Commission
. . . your service as secretary of the Metropolitan Milwaukee War Memorial
. . . your survey in 1925 of Vocational Education in the Chicago Continuation Schools
. . . your participation in 1943 in the Strayer Survey of the New York City Schools
. . . your study in 1944 of mechanical industries at Tuskegee Institute
. . . your service in 1944 and 1945 as Consultant for the Job Skills Training Program of the Civilian Training Branch, Industrial Personnel Division, Army Service Forces
. . . your service from 1943 to 1945 as Chairman of the Technical Committee on Classification and Compensation of Public Employees of five units of Government of the Metropolitan Milwaukee area
. . . your warm friendship, guidance, and helpfulness to all those with whom you have been associated
WILLIAM F. RASCHE, we of THE SHIP are privileged to honor you by paying public tribute to your outstanding and constructive Educational Leadership. We salute you for your
DISTINGUISHED SERVICES TO MANKIND
Given under our hand this Eighth Day of August, One Thousand Nine Hundred Fifty-seven, A. D. at the Fifty-First Annual Convention of the American Vocational Association in Philadelphia, Pennsylvania.
THE SHIP
A naval organization of representatives of firms in the field of industrial and vocational education

Dr. William F. Rasche, Director and Principal of the Milwaukee Vocational and Adult Education Schools, receives Ship's Citation

HIGH LIGHTS OF THE GRAPHIC ARTS SESSION — AVA

During the American Vocational Association Convention which was held August 4 to 9, 1957, at Convention Hall, Philadelphia, Pa., there was a special session of the graphic arts division.

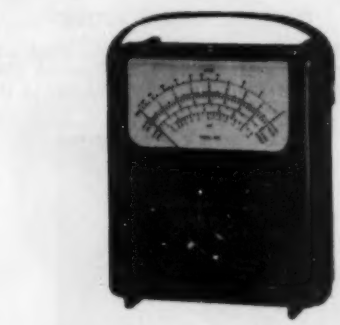
They conducted their program on Thursday, August 8, at 8:30 a.m., and the theme of this meeting was "Modern Schools and Graphic Arts Education."

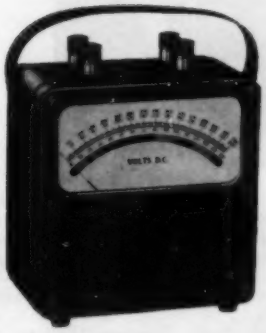
The chairman was John G. Henderson, head, printing department, Washburne Trade School, Chicago, Ill.

Speakers were Edward M. Claude, chief, trade and industrial education, Illinois Board for Vocational Education, Springfield, Ill., and Dr. Hobart H. Sommers, assistant superintendent, vocational education, Public Schools, Chicago, Ill., and their topics were respectively: "How Graphic Arts Education Programs Meet the Objectives for Trade and Industrial Education in Secondary Schools"; and "How the School System Can Organize and Enlist the Support of Local Printing Industry Groups for Graphic Arts Education Programs."

Commentary by Elmer E. Vosburg, vice-

(Continued on page 22A)





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- ☐ Circuit analyzers
- ☐ Panel and Portable instruments

ASSOCIATION NEWS

(Continued from page 276)

principal, Dobbins Vocational-Technical School, Philadelphia, Pa.; Charles E. Kennedy, director, Southern School of Printing, Nashville, Tenn.; George Hess, Williams & Marcus-Franklin Printing Company, Primos, Pa.; Bruce Cheadle, instructor, Englewood High School, Chicago, Ill.; and Samuel M. Burt, executive director, International Graphic Arts Education Association, Washington, D. C.

A special demonstration took place, on a fast simple and economical new technique and new film in preparing black and white slides for use in visual aid programs — "Making Slides With the Polaroid-Land Camera — 3 Minutes from Shooting Picture to Projecting the Slide," by Harry A. Goldstein, A.P.S.A., instructor in photography, Senior High School, Tucson, Ariz.

James Henderson, printing instructor, Dobbins Vocational Technical School, Philadelphia, was host.

Joseph Ferencz, printing instructor, High School, McKeesport, Pa., was recorder.

ANNUAL MEETING IN MAINE

The Maine Association for Industrial Education will hold its annual meeting on October 3 and 4, during the Maine Teachers' Convention in Portland, Me.

INDUSTRIAL EDUCATION INSTITUTE

The San Francisco-Oakland Bay Section of the California Industrial Education Association will conduct an Industrial Education Institute on Saturday, October 26, 1957, from 8:30 a.m., to 2:00 p.m., at the Laney Trade and Technical Division of the Oakland Junior College, Third Avenue at Tenth Street, Oakland, Calif. Don Taylor is general chairman of the Institute.

Emphasis is to be placed upon instructional techniques and teaching aids. Demonstrations in most areas of industrial education will be presented in each of the two morning sessions.

Epsilon Pi Tau will serve coffee from 8:30 to 9:15 a.m., and a luncheon will follow the morning activities.

All teachers and friends of industrial education are cordially invited to attend. — *Glenn I. Newhouse, Bay Sect. President.*

INDUSTRIAL ARTS CONFERENCE AT BUFFALO

"Brainstorming" will be the theme of the Western Zone Industrial Arts Conference to be held Friday, October 25 at the State University of New York College for Teachers at Buffalo.

After listening to an address on "Brainstorming: A Means to Professional Improvement," the conferees will be assigned to small groups where they will use the brainstorming technique to suggest solutions for many of the common problems facing industrial-arts teachers.

Other features of the conference include a display of representative industrial-arts projects made by pupils in various school shops and awards for outstanding work; a coffee hour for all conferees; a display of modern shop equipment, materials and techniques by commercial exhibitors; an informal luncheon; "open house" visits to the college shops and other facilities; and a dinner meeting at which an outstanding speaker will make a timely and interesting address.

All industrial-arts teachers and persons interested in industrial-arts education are cordially invited to participate in this stimulating conference.

FOUR-STATE REGIONAL CONFERENCE

The 1957 Four-State Regional Industrial Arts and Vocational Education Conference will be held at the Kansas State Teachers College, Pittsburg, Kans., on Friday and Saturday, October 11 and 12.

Dr. Warren C. Lovinger, president of the Central Missouri State College, Warrensburg, Mo., and John P. Walsh, director of trade and industrial education, U. S. Office of Education, will be among the principal speakers.

The theme of the conference centers on technical education. In line with the theme, a variety of both general and sectional meetings have been arranged, and a large number of commercial exhibits will be on hand. — *J. V. Melton, secretary.*

PERSONAL NEWS

(Continued from page 10A)

to Oswego in 1921 from Buffalo where he had been an instructor in electricity in Seneca Vocational school.

Mr. Karcher attended the State University of New York Teachers College at Buffalo, Cornell University, Syracuse University, New York University, University of Buffalo, and State Teachers College at Oswego. A B.S. degree was conferred on him by Syracuse University in 1928, and a M.A. degree by New York University in 1935.

Harry M. Karcher

He was appointed by the Board of Regents and acted as chairman in preparation of the first state sponsored "course of study" in industrial arts electricity. Recently, he was a member of the State Committee to revise the "state course of industrial arts electricity," now being used throughout the state.

Mr. Karcher is the author of several monographs in industrial arts electricity being widely used at present.

Among the professional organizations to which Mr. Karcher belongs are the New York State Teachers Association, New York State Vocational and Practical Arts Association, American Vocational Association, and the North Central Industrial Arts Association.

He was an organizer and first faculty adviser to Delta Kappa fraternity in 1926. He remained actively associated with this group for many years. He is a member of Kappa Phi Kappa fraternity.

He is a veteran of World War I, having served for two years with the American Expeditionary Forces in Europe.

OTTO C. OLSEN RETIRES

Otto C. Olsen, head of the industrial arts department at Nebraska State Teachers College, Kearney, Neb., retired at the end of the 1957 summer session.

Otto C. Olsen

Mr. Olsen was born at Lilly, Mich., on October 21, 1887. He attended grade school at Jennings, Mich., after which he spent some years working in a planing mill. At the age of 21 he entered Augustana Academy at Rock Island, Ill., and completed his secondary work in three years.

He entered State Teachers College at Kearney, Neb. After three years of college work he became superintendent of schools at Wauneta, Neb. He remained there for three years. At the end of World War I he went back to State Teachers College at Kearney, Neb.

In 1919 he received his A.B. in education. Then he joined the industrial-arts faculty at Nebraska State Teachers College, and in 1937 was made head of the industrial arts department. Two years later he became chairman of the Vocational Arts Division, which includes the commerce, home economics, and industrial-arts departments.

Mr. Olsen is past president of the local unit of the National Education Association, and past president of the Nebraska Industrial Arts Teachers Association. He has been chairman of the Red Cross Safety and First Aid Committee for eight years.

MR. KRUBECK IN NEW POSITION

Floyd Krubeck, associate professor of industrial arts at Nebraska State Teachers College, Kearney, Neb., will assume the chairmanship duties of the Vocational Arts Division, to succeed Otto C. Olsen, who retired at the end of this summer.

DEGREE CONFERRED ON WILLIAM T. SARGENT

The doctor of education degree was conferred on William T. Sargent by Wayne State University, January 29. He received his B.S. degree at Northern Michigan College, Marquette, Mich., with a major in industrial-arts education in 1941 and his M.Ed. degree from Wayne State University in 1948.

His dissertation, *Student Teaching In Off-Campus Programs In Industrial Arts*, was a descriptive-survey directed toward identifying commendable aspects of current programs and to apply the findings in developing (1) an off-campus program for the Department

(Continued on page 24A)

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PERSONAL NEWS

(Continued from page 22A)

of Industrial Arts, Northern Michigan College, Marquette, (2) a handbook for student teachers in off-campus programs, and (3) a brochure for off-campus personnel with supervisory responsibilities.

Dr. Sargent is a professor of industrial arts at Northern Michigan College, Marquette, Mich. Prior to this assignment, he taught industrial arts in the Detroit Public Schools. During World War II, he served as instructor in the U. S. Naval Technical Training Program.

He is a member of Michigan Education Association, National Education Association, Michigan Industrial Education Society, American Industrial Arts Association, American Council on Industrial Arts Teacher Education, Association for Student Teaching, and State Industrial Arts Curriculum Committee for Michigan. He also holds memberships in Epsilon Pi Tau, Mu Sigma Pi, and Phi Delta Kappa fraternities.

Dr. William T. Sargent

T. L. HOLLEY RETIRES

Thomas L. Holley, teacher trainer, who was graduated at Prairie View A. & M. College, Prairie View, Tex., and began teaching in 1910, retired from his teaching career effective April 30, 1957.

Thomas L. Holley

He is credited with being the first Negro supervisor of Vocational Trades and Industrial Education in Texas, and with many other advancements in education for youth and adults.

VEZZANI RETURNS TO MICHIGAN

Almando A. Vezzani, assistant professor of vocational education and practical arts at The University of Michigan, Ann Arbor, has just returned from a 30 months' stay in Mexico City where he went in 1954 as chief technical adviser for the development of a new school for the training of operators and mechanics of highway construction, transportation, and farm equipment.

The school — Centro de Adiestramiento de Operadores — was created through the interest of the Mexican Highway Association, the Ministry of Communications and Public Operations of the Mexican Government and the International Road Federation.

According to Professor Vezzani, these agencies, through a survey made in 1950, discovered an acute need for personnel trained in the operation and repair of highway, transportation, and farm equipment.

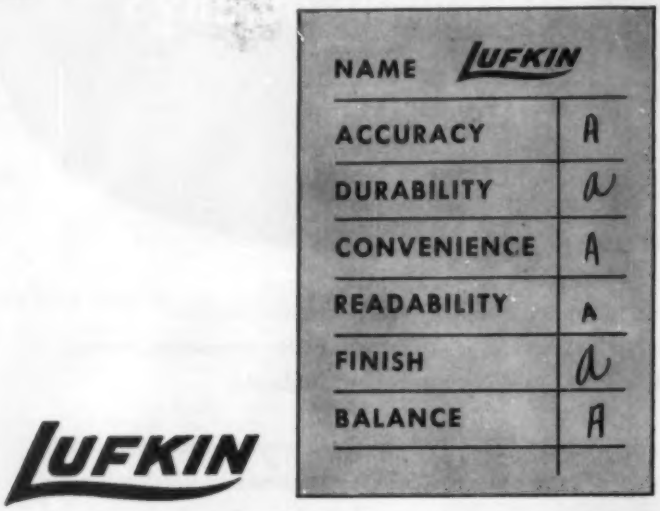
Technical assistance is provided by the International Cooperation Administration (ICA) through an agreement, signed in April, 1954, between the Mexican and United States Governments.

Subjects taught at the Centro are: theory for each shop, shop mathematics, shop drawing and blueprint reading, technical English, applied physics, basic hand tools theory and personal efficiency. The personal efficiency course covers such items as personal hygiene, how to apply for a job, how to complete a job application form, social security union regulations. Present enrollment at the school is over 500.

DR. FINKELHOR RECEIVES HONORS

Three appointments to high educational committees have been announced for Dr.

(Continued on page 26A)



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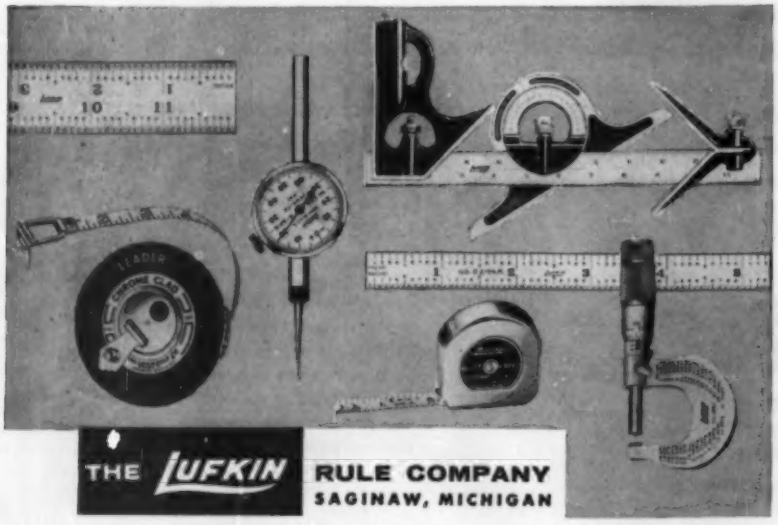

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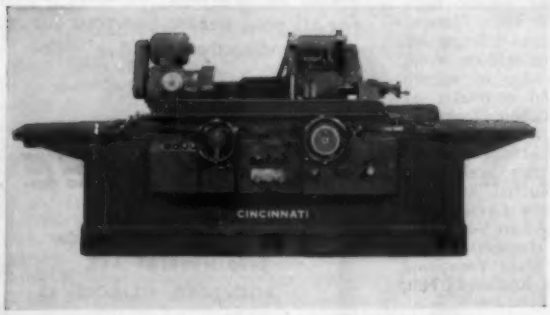

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PERSONAL NEWS

(Continued from page 24A)

Dorothy Finkelhor, founder of the Business Training College, Pittsburgh, Pa.

Early in May, 1957, she was named to the State Board of Private Business Schools in an announcement by the Pennsylvania State Department of Public Instruction. Then came the appointment of Dr. Finkelhor as a delegate for the coming conference of the Middle Atlantic Region of the President's Committee on Education Beyond the High School.

At the recent convention in New York of the Eastern Business Teachers Association Dr. Finkelhor was named to the Executive Board. Dr. Finkelhor, who started the Business Training College in 1933, is an author, lecturer, and mother of three daughters. Her husband, Herbert Finkelhor, is president of the Business Training College, and managing director of the Dale Carnegie Courses in Western Pennsylvania.

STUDENT AWARDED FELLOWSHIP

Richard T. Denton, a University of Michigan student who is currently working toward a doctor's degree in electrical engineering, has been awarded the National Electronics Conference fellowship in electronics for the 1957–58 academic year.

The award is the first to be given under a recently adopted program for sponsoring advanced study in electronics, according to Dr. C. E. Barthel, Jr., conference president.

The winner was chosen in national competition. The NEC fellowship, worth $2,500, is for a year of graduate study at any of eight colleges and universities participating in the conference.

These include Illinois Institute of Technology, Northwestern University, and University of Illinois as sponsors, and Michigan, Michigan State, Purdue, Notre Dame, and Wisconsin universities as co-operating institutions.

The National Electronics Conference is held annually in Chicago for discussion of advances in electronic research, development, and application.

MR. SECKENDORF IN NEW POSITION

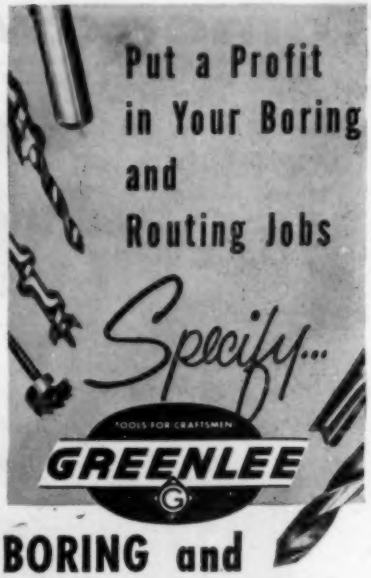
Robert S. Seckendorf has been appointed to the position of supervisor in the Bureau of Industrial Arts Education, New York State Education Department, effective August 1, 1957.

Mr. Seckendorf has been a teacher of industrial arts in the New York City junior high schools for the past eight years. His experience has been in the fields of graphic arts and printing, metalwork, and ceramics. His last position was at the Russell Sage Junior High School in Forest Hills, Queens.

Mr. Seckendorf is presently completing his work for the doctorate degree at New York University. He holds a bachelor of science degree in industrial arts and a master of arts degree in elementary education from the same college.

For several years, Mr. Seckendorf participated in the work of the New York State Steering Committee for Industrial Arts and served as its chairman for two terms.

He is a member of the American Vocational Association, the American Industrial Arts Association, the New York State Vocational and Practical Arts Association, Epsilon Pi Tau, and Kappa Delta Pi.



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News Notes

FORD MOTOR COMPANY SCHOLARSHIPS AWARDED

Seventy high school seniors from 13 states have been awarded four-year scholarships by the Ford Motor Company Fund. Thirty-eight of the winners were from Michigan.

Telegrams of notification were sent to the students on Easter Sunday by Henry Ford II, president of the company, and also president of the Fund.

The scholarships, which go to sons and daughters of Ford employees, provide for the payment of tuition and fees and a major portion of living costs, and the recipient may select any approved college or university in the United States.

Winners of the Ford Fund's seventh scholarship competition were picked from 654 applicants who were scholastically in the upper one third of their graduating classes, and who had met other stated requirements. The selection was made April 1 and 2 by the Ford Fund Scholarship Board, comprised of the presidents of nine American universities.

In addition to the 38 from Michigan, there were five each from New York, Ohio, and Illinois; three each from California and Minnesota. Georgia, North Dakota, and Kentucky had one each.

In three cases, scholarship recipients were the second from the same family to win the honor.

The 70 winners were brought to Dearborn for a formal awards conference on June 30, and remained in Dearborn as guests of the Ford Motor Company Fund through July 1 and 2.

The Ford Fund Scholarships provide for the payment of tuition costs and all academic fees, and 80 per cent of normal living costs, up to a maximum of $750 a year for students attending school away from home. For those living at home and attending school, maximum payment for living costs is $300 a year.

The Ford Fund also makes a cost-of-education grant of $500 a year to privately endowed colleges or universities for each scholarship winner in attendance. At the present time, 274 students are attending 84 institutions of learning on Ford Fund scholarships.

NEW YORK UNIVERSITY

New York University's offices of admissions and registration, which have been under common management, are being reorganized along parallel lines within the office of NYU's executive vice-president, the institution's chief educational officer.

Dr. Carroll V. Newsom, president of the University, announced that the change became effective on July 1, 1957.

The shift is designed to accomplish two objectives — to redistribute heavy administrative burdens and to enhance the effectiveness of these intimately associated functions by relating them more closely to the academic program.

Dr. Elwood C. Kastner, who has been dean of admissions and registrar, will become dean of registration and financial aid. The position is a new one. In addition to the duties implied in his title, he will be responsible for long-range studies on such matters as plans for possible expansion of enrollment at New York University.

Henry F. Rossi, associate registrar, will be promoted to registrar within Dean Kastner's office.

(Continued on page 30A)

Hamilton equipment creates an atmosphere for work and study!

The contemporary styling of new Hamilton equipment gives a creative atmosphere to your instruction centers — makes teaching more productive — learning more enjoyable. Never before have wood, steel and color been so imaginatively combined to provide such a pleasant setting for both teacher and pupil.

Whether you're planning new construction, remodeling or just looking for ideas, you'll want to see the complete line of industrial arts furniture in Hamilton's Arts and Crafts Catalog 219. You'll find it the most economical and highly functional line available. Write for your free copy soon . . . Arts and Crafts Catalog 219!

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4800-*series* LATHES

Long acclaimed the outstanding lathe for school shops, the Clausing 4800-series now offers you *more* than ever before in *service life, safety, ease of operation* and *value.*

Flame hardened bed ways at no extra cost . . . enclosed underneath drive, with heavy-duty ball bearing countershaft . . . Timken tapered roller bearings . . . totally enclosed apron with oil bath lubrication . . . 7/8" diameter lead screw . . . these and other quality features of expensive lathes are standard on the 4800-series, as listed below. Yet they cost no more than smaller, lighter machines.

Examine all the features and compare with any other lathe in its class — feature for feature, dollar for dollar. We know you'll agree with instructor Robert Sharp whose experience with Clausing lathes is quoted on the facing page. Clausing is *far* ahead of the field — *the* lathe for *your* shop.

10 REASONS why *CLAUSING* gives you more in Service . . . Safety . . . and Value!

1. Bed ways are flame hardened for longer wear — a feature that costs many dollars extra with other lathes.
2. Drive is underneath and headstock has hood guard . . . there are no exposed belts or gears to catch clothing or fingers.
3. Countershaft turns on sealed-for-life ball bearings, and is mounted on 4 vibration dampeners. Provides 10 speeds.
4. Three long-wearing, modified wedge belts transfer power from countershaft to spindle.
5. Headstock spindle turns on selected Timken tapered roller bearings.
6. Apron is totally enclosed and gears and shafts travel in bath of oil — another important safety and service feature exclusive with Clausing.
7. Lead screw is 7/8" diameter — largest in price class. Has easy-to-replace shear pin.
8. Heavy-duty tailstock has No. 3 MT ram with tang socket, permanently attached wrench for bed lock.
9. Cabinet furnished is 3/16" steel plate — a rigid mount. Top is chip pan. Tailstock pedestal has two drawers.
10. And Clausing is an outstanding value — a big 12¾" lathe, with quality features — and . . .

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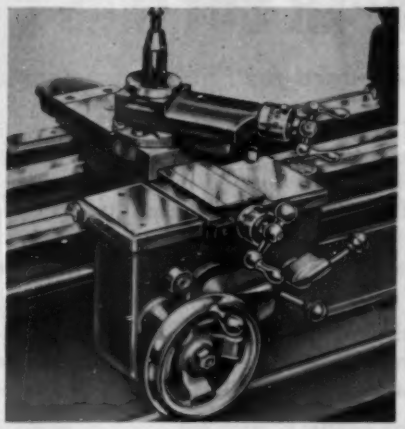
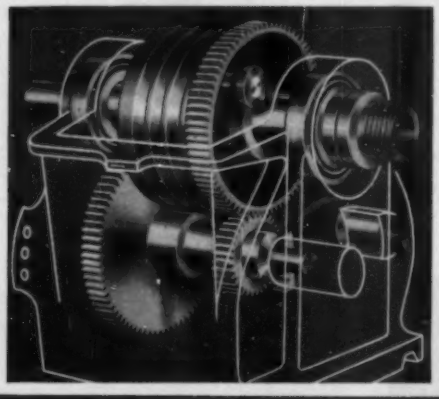
Robert Sharp
Community High School
Normal, Illinois





TOP LEFT Clausing bed is 7⅜" wide, 5⅛" deep. Two V and two flat ways are flame hardened and precision ground. Bed length — 47" and 59".

TOP CENTER The one-piece, double-walled, box-type apron is a rigid housing for the feed mechanism. Gears and shafts run [illegible] bath of oil. Has safety clutch.

TOP RIGHT Note the heavy-duty construction of the underneath-drive countershaft.

LEFT The headstock spindle turns on selected Timken tapered roller bearings. Spindle, threads, and taper are precision ground.

NEWS NOTES

(Continued from page 27A)

Dr. Thomas P. Robinson, assistant to the Dean at NYU's College of Arts and Science, will assume the new post of director of admissions. He will head the University's overall program, including liaison with high schools and the development of general admissions policies.

WORK SIMPLIFICATION ON FILM

A new 20-page brochure describing 60 films on the work simplification methods of leading American industrial concerns now is available from the Industrial Management Society. The films may be rented for five-day periods.

The films were placed in the special loan collection for winning awards in annual IMS Methods Improvement Competitions. Entries in the contest are films showing, in "before" and "after" sequences, how work simplification techniques solved problems and lowered costs. Both office and plant situations are described.

All the films are 16mm., and many are in color. They run 10 to 15 minutes each. Optical sound, silent, and magnetic sound films are included.

Entitled "Work Simplification on Film," the brochure can be obtained by writing the *Industrial Management Society, 330 South Wells St., Chicago.* It supersedes a much smaller booklet of the same name heretofore distributed.

OFFICERS NAMED

The Printing Teachers Guild of New York announces the results of its recent meeting, held at the Offset Showrooms of the American Type Founders in New York City, at which the following officers were unanimously elected for the coming administration: president — Leo Hochwald, chairman, New York School of Printing; vice-president — John M. Fontana, graphic arts instructor, Somers Junior High School, and chairman of the 1957 International Benjamin Franklin Week Celebration; treasurer — Max R. Kirshner, printing instructor, New York School of Printing; and secretary — Gerald J. Mallon, printing instructor, Westbury High School. — *S. Seegay, chairman, Publicity Committee.*

RECOMMENDED SAFETY PRACTICES FOR THE PROTECTION OF WORKERS IN FOUNDRIES

Because new foundry processes have created new safety requirements, the American Founddrymen's Society, Des Plaines, Ill., has issued a new manual, selling at $2 to AFS members; $4 list.

This manual is a continuing effort of the Society to help foundry management and technical people accomplish their collective goal of ever improving working conditions in the foundry industry. Published under the direction of the AFS Safety, Hygiene and Air Pollution Control Program, the new manual was designed to meet two objectives: (1) to provide guides to making the foundry an even safer and better place to work; (2) to standardize safe practices in all foundries regardless of size.

The new manual is the third in the current series of three, the two previous ones being: "Air Pollution Manual," for meeting exterior requirements, and "Engineering Control for In-Plant Environment," for interior conditions guidance.

The newest addition deals solely with aspects of industrial environment not contained in the previous manuals. It contains fundamental information relating to design, construction, and application of safeguards; to personal protective devices for the prevention of injury; and methods of promoting good housekeeping. The safe practices recommended in the manual pertain to all branches of the metal castings industry.

ANNUAL READING INSTITUTE

The next Annual Reading Institute at Temple University will be held in Philadelphia, Pa., January 27 through January 31, 1958, inclusive. The theme of this institute will be "Reading in the Total School Program."

Further information may be obtained by writing to: *The Reading Clinic, Department of Psychology, Temple University, Philadelphia 22, Pa.*

COMBINATION JUNIOR, SENIOR HIGH, AND VOCATIONAL SCHOOL

The W. Tresper Clarke High School, designed to provide facilities for a complete vocational program along with a fully modern academic curriculum has been designed by Frederic P. Wiedersum Associates, for the Union Free School District No. 3, East Meadow, Long Island, N. Y.

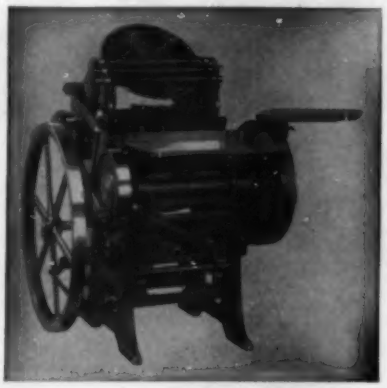
It is to accommodate 2660 students and is scheduled for completion in September. It will cost $6,155,000.

"OUR MANPOWER FUTURE"

A new publication by the U. S. Department of Labor, this is a chartbook presentation (14 charts accompanied by text) depicting

(Continued on page 32A)

C&P NEW SERIES PRESSES These presses in sizes of 8x12, 10x15, 12x18 and 14½x22, provide the student with equipment that furnishes all practical requirements of hand fed press operation. May be equipped with flywheel, belt and platen guards. Also furnished for treadle operation instead of motor drive.



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PRESSES and PAPER CUTTERS

C&P BENCH CUTTER An efficient, small size cutter that handles sheets up to 19" x 24". Equipped with two-handed safety control.

C&P PILOT PRESS A thoroughly efficient little press, chase 6½x10, that teaches basic principles of press operation with exceptionally fine printing results.

The Standard for Printing Education

C & P presses and paper cutters have been standard equipment in commercial plants and schools for over 50 years. So, the selection of C & P equipment for printing classes places before the students *practical* equipment exactly as used in commercial practice in the entire printing industry.

In addition, special safety features are incorporated, when desired, in C & P presses and paper cutters so that all safety requirements are fully satisfied.

For practical instruction—for safety in use—the foresighted administrator recommends . . . Chandler & Price.

"HANDBOOK OF PLATEN PRESSWORK" *is one of the outstanding aids to printing furnished without charge to printing instructors. If you do not have a copy, just request one.*

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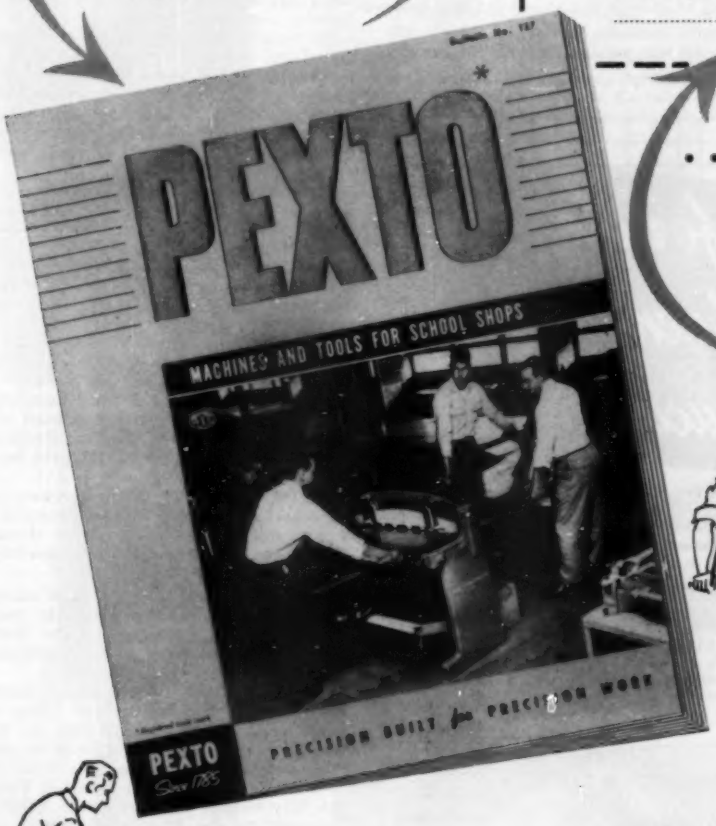

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Vocational Arts Instructors will want this up-to-the-minute information on Sheet Metal Fabrication to teach and prepare students for the ever-increasing opportunities in Air Conditioning, Heating, Industrial, Construction, and Aircraft industries.

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Use the convenient coupon above to obtain this new manual . . . one of the many helps PEXTO offers. We also welcome your inquiries for any assistance we can provide relative to sheet metal working.

PECK, STOW & WILCOX COMPANY
School Shop Division
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NEWS NOTES

(Continued from page 30A)

anticipated changes in our population and labor force to 1965, with some of the implications for our educational system, our industrial training programs, and our plans for man-power utilization.

Copies are available at 30 cents each from the *Superintendent of Documents, Washington 25, D. C.*

THE JONAS E. SALK SCHOOL

A V-shaped school, named in honor of the discoverer of the polio vaccine, Jonas E. Salk, will be open in September to junior and senior high school students of Levittown, L. I., N. Y., considered America's largest and most outstanding postwar community built mainly to house the families of World War II veterans.

The 1200-pupil modern high school, designed by Frederic P. Wiedersum Associates in an appropriate "V" shape, is believed to be the first school named for the now famous doctor who discovered the vaccine which already appears to have slashed the incidence of polio cases in Levittown from 63 in 1950 to only 3 in 1956.

The 26-classroom school being built at a cost of $2,235,000 will include facilities for homemaking, industrial arts, science, business education, art, vocational shops, administration, health, guidance, and study halls. It will have a 500-seat auditorium, cafeteria, faculty and student activity rooms, and gymnasium with folding bleachers for 500.

♦ Ohio State University's third annual Executive Development Program was held August 25 to September 7, 1957, on the campus with 79 men, representing industries in 14 states, participating.

The College of Commerce and Administration at the university in co-operation with the Ohio Manufacturers Association, sponsored the program as an educational service to the business community.

Dr. William R. Davidson, associate professor of business organization, author and business consultant, was the director.

To complete the program, executives must attend two summer sessions of 14 days each in two successive years. Enrollment in the first-year group this summer was limited to 42. Thirty-seven of the registrants returned for their second and final summer session. They received certificates of completion at the close of the term, September 7.

President Novice G. Fawcett of Ohio State spoke at a reception and dinner, on Sunday, August 25, at Ilonka's Provincial House, to open the program.

Professor Ralph C. Davis, chairman of the joint policy committee of 15 industrialists and educators who planned the 1957 program, presided at this event.

The Executive Development Program was planned in response to expressions of need for a course that goes beyond the work that can be done by the individual company to develop attitudes and skills demanded of executives in policy level position. Representatives of 50 companies have taken the training during its first two years.

All seminar sessions during the two weeks were held in the Ohio Union. Commerce college faculty members with business consulting as well as teaching experience, headed the seminars.

♦ Two titles have recently been added to the growing list of industrial safety manuals and guidebooks published by the Accident Prevention Department of the Association of Casualty and Surety Companies.

They are "Power Line Safety Manual," which deals with that area of utility company work which is responsible for nearly two thirds of all fatal accidents in the electric light and power industry; and "Your Guide to the Safe Use of Power-Actuated Tools" — the fifty-seventh in a series of guidebooks published by the Association each of which discusses the hazards inherent in some profession, procedure or piece of equipment, and which sets forth rules for the safe elimination or circumlocution of those hazards.

Three new pocket-size safety manuals have been published by the Industrial Safety Division of the Association of Casualty and Surety Companies. Two of the booklets, one on welding and cutting operations and one on blasting operations, are intended for use by workers, whether beginners or experienced workmen — who are actively engaged in the performance of the particular operations. They are entitled: "Your Guide to Safety in Welding and Cutting Operations," "Your Guide to Safety When Blasting," and "Your Guide to Safety from Electrical Hazards."

The booklets are available to industry or to the public through member companies of the Association and their agents.

Association of Casualty and Surety Companies, 60 John St., New York 38, N. Y.

♦ New publications which have just recently been issued by the U. S. Forest Products Laboratory, Madison, Wis., are available without charge. They are:

(Continued on page 34A)

38 live ideas for the metal and general shop instructor
BRAND NEW!
Contemporary Sheet Metal Projects for beginning metal workers
Six spanking new projects that teach sheet and perforated metal on the Bender, Roller and Brake.
UP-TO-DATE!
Suggestions in Wrought Iron for the Modern Home
Eight excellent examples of functional design that combine wood with wrought iron and expanded metal.
Just Printed! Excerpts from "Contemporary Metal Home Furnishings"
Six projects featuring rod, tube and angle forming selected from the 58 designs of Lux and Towers new book.
New Portfolio
Forming Plastic Sheet Materials
Twelve plastic projects that will help you plan stretch, vacuum and blow forming in the exciting area of the new Di-Acro Plastic Press.
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PRECISION METALWORKING MACHINES
Di-Acro Plans in single sets available to instructors free of charge. In classroom lots—25c each.
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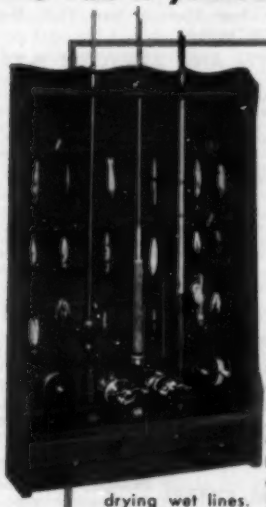
SPUR INTEREST, SERVE EVERYDAY NEEDS

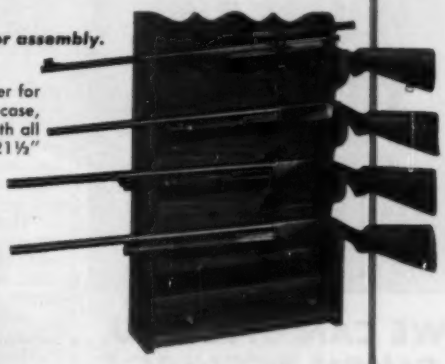
6 "do-it-yourself" kits made of genuine Tennessee aromatic RED CEDAR from GILES & KENDALL CO.



Pre-cut! No waste!

Every kit complete with hardware and directions for assembly.

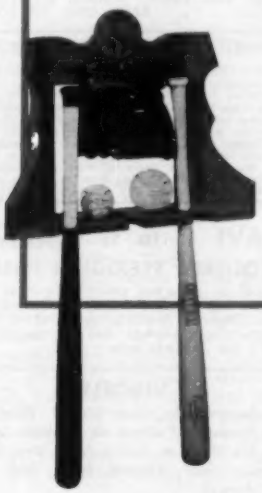
#404 Four-Gun Rack with full width drawer for ammunition and cleaning gear. Solid cedar case, matched cedar plywood back. Complete with all screws, brass pulls, safety lock. 32" high, 21½" wide.



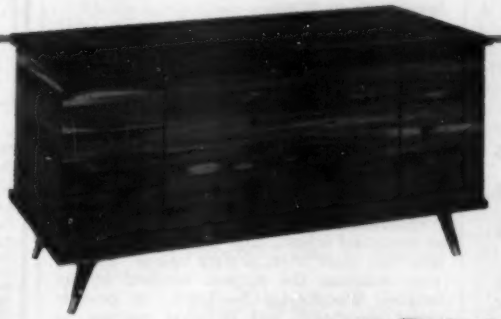
#303 Tackle Rack with full width drawer for hooks and accessories. Holds rods, reels, any number of flies, lures, plugs. Handy brass hooks around case for drying wet lines. Solid cedar with matched cedar plywood back. Complete with screws, brass hooks, drawer pulls. 38" high, 21½" wide.

#183 Football Rack, solid cedar. Hangs on wall. 18½" wide, 18" high.

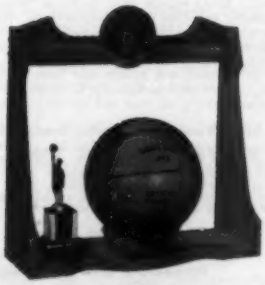
#M-17 Cocktail Table, solid cedar. 20" x 44", stands 15" high. Complete with hardware including brass ferrules on legs.



#182 Baseball Rack, solid cedar. Hangs in corner or anywhere in room. 22" wide, 18" high.



#101 Cedar Chest, from heart of genuine Tennessee aromatic red cedar. Solid ¾", with 5-ply panel top that will not warp or crack. Mothproof. Complete with all hardware. Also walnut, mahogany and oak cedar chests. Wide selection in sizes and styles.



#180 Basketball Rack, solid cedar. 18½" wide, 19" high.

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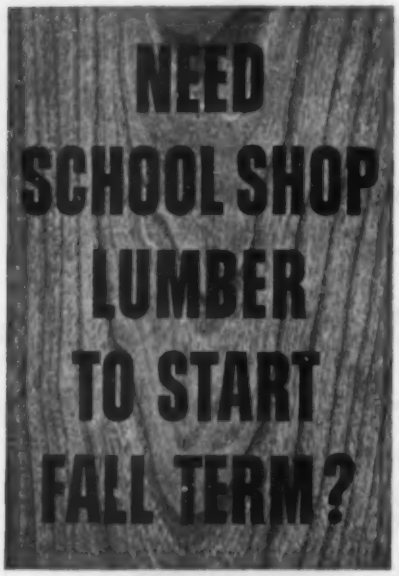

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BALSA	RED OAK
BASSWOOD	WALNUT
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BIRCH	WHITE PINE
CHERRY	WILLOW
CHESTNUT	BALL BAT BILLETS
LIMBA	BIRCH DOWELS
MAHOGANY	DRAWING BOARDS
MAPLE	PLYWOODS
POPLAR	TURNING SQUARES

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NEWS NOTES

(Continued from page 32A)

"Effects of Moisture on Bacterial Weakening of Casein-Bonded Plywood," Report No. 2077. This book summarizes methods, materials, and results of laboratory testing to determine effects of bacterial infection of glue lines in casein-bonded yellow birch plywood at different moisture content levels.

"Fire Retardant Treatments for Wood," Report No. 2081, compares fire-retarding paints and impregnation treatments as to their effectiveness, and gives data on their general durability and methods of application.

"Comparison of Wood Preservatives in Stake Tests," Report No. 1761, is a 1957 progress report of long-time tests of preservative-treated southern yellow pine sapwood stakes installed by the Forest Products Laboratory and co-operators to determine decay and termite resistance of preservatives and treating methods at various climatic sites.

"Timber Resources," Report No. 2080, is a general assay of United States forest resources, what they are, and what they need to be to meet future requirements of the nation. The report was presented by Laboratory Director J. A. Hall to a University of Wisconsin forum.

"Tooth-Planing Not Necessary to Produce Strong Glued Wood Joints," Technical Note No. 227, explains why tooth planing, sanding, and similar operations are not necessary to make strong glued joints in normal wood.

♦ An Original Heidelberg platen press has recently been installed in the new printing wing (7000 square feet) of the recently constructed Trades and Industry Building of Ferris Institute, Big Rapids, Mich. This is one of hundreds of Original Heidelbergs used for instruction in letterpress printing by institutions throughout the world.

The printing department of Ferris Institute is sponsored by the Michigan Press Association, many of whose members also have Heidelberg presses. Students of the department are much in demand and upon graduation a large proportion are employed by Association members.

Ferris Institute offers its graphic arts students a choice of two two-year printing courses, one general and the other covering management and supervision. First-year students in both courses receive basic training in composition, letterpress, offset, bindery work, and photoengraving. In their second year, management students also receive instruction in such subjects as advertising, salesmanship, accounting, and other related fields.

Founded in 1884, Ferris Institute was first an industrial school, later a nonprofit institution, and since 1950, a state college; but always fulfilling the purpose outlined by its founder, Woodbridge N. Ferris: to provide useful vocational and technical training to students of all ages and abilities. More than 70,000 students have taken its courses.

Jon P. Adams is dean of the Trade and Industrial Division, of which printing is a part, of Ferris Institute.

♦ The Western Pine Association has announced the publication of supplements Nos. 2 and 3 to the 1956 association grading rules, effective May 1, 1957.

Supplement No. 2 clarifies reinspection provisions of the association grading rules, adds a new grade called "pitch select," provides alternate rules for grading hemlock and/or larch, and makes changes in optional moisture content standards.

Supplement No. 3 revises stress grades for Douglas Fir and Larch, making five standard

AMAZING NEW PLASTICS INSPIRE GREATER STUDENT INTEREST!

Include Shop Projects Requiring These New Wonder Materials in Your Plastics Course, and Teach Your Students New Skills They Will Use On-The-Job!

SYNSKYN AND ACRYLOID B-72

Now, you can really stimulate the artistic talents of your students in plastic craftwork! Using Acryloid B-72 (a clear, syrup-like liquid that hardens to a waterproof film), you can embed thin, colorful objects on Synskyn (a translucent, fire-resistant Polyplastex material) to make a wide variety of unusual and breath-takingly beautiful panellings. Acryloid B-72 is employed both as an adhesive to hold the decorative pieces on the Synskyn base, and as a finish coating over the completed surface. Leaves, flowers, small shells, ferns, butterflies, feathers, fishing lures, photos make perfect decorations, and the panels are ideal for folding screens, room dividers, lamp shades, sliding doors, etc. Write for details.

FIBERGLAS-POLYESTER & EPOXY RESINS

For Building Boats, Work Bench Tops, Awnings, Furniture, Jigs and Fixtures; Repairing and Restyling Auto Bodies and Fenders.

Send for FREE literature giving complete buying information on everything you need in Fiberglas-Plastic for the school shop. It describes in detail Glass Cloth, Extenders, Catalysts, Solvents, "How-To" books, etc.

SPECIAL OFFER! Fiberglas-Polyester "COVER-IT" KIT

Contains the right amount of material for the beginner student, or to experiment with yourself. Let's you see how easy it is to repair boats, toys, lamps, furniture, etc. Complete Kit.....$3.95 (plus 50c postage.)

WHITE POLYETHYLENE ROPE

It floats! Produced by the twisted-spun-laid method. It's attractive, long lasting, lightweight, dimensionally stable. Completely waterproof and buoyant. 30% lighter than natural fibre rope. Has extremely high resistance to virtually all types of acids and solvents, salt water, alcohol. It is unaffected by mold, bacteria, rot, fungi. Has excellent weathering characteristics. Does not deteriorate with age. Available in 3/16" to 3/4" dia. Ideal for water ski tow lines, lane markers for swimming pools, heaving lines and other life-saving equipment, functional and decorative applications.

SAVE ⅓ to ½ OVER REGULAR PRICES!

COLORED PLEXIGLAS PANELS

3 tons at give-away prices! We made a fortunate buy and are passing the savings on to you. Choice of beautiful shades of all popular colors. Paper masked. Ask for Special Flyer CP-2 for complete data.

VINOFLEX

the Remarkable New Liquid Vinyl Plastic that Produces Foliage so Realistic and Life-Like It's Hard to Tell it From Live, Growing Leaves when Viewed from Just a Few Feet Away!

Makes perfect decorations for windows and planter boxes. Pours easily and forms a tough, resilient, rubbery material when exposed to oven heat of from 300 to 325 deg. F. It's fireproof, washable, fade-resistant, droopless. Can be cleansed with a damp cloth. Available in white opaque, clear, light or dark green, red, yellow and blue. Comes in 8 oz., pint, quart and gallon sizes. Ideal for making an endless variety of toys and novelties, too!

Build Your Own Plastic Greenhouse with

POLYETHYLENE & VINYL FILM

We have them 0.002" and thicker. Vinyl in rolls up to 6 ft. wide; Polyethylene up to 20 ft. wide. Also make a perfect moisture barrier and mulch on strawberry plant and flower beds.

Send for Our Price List!
America's Most Complete and Up-to-Date Line of Plastics!

It gives helpful buying data on Plexiglas, Acetate, Castolite, Molding Powders and Presses, Cold Setting and Hot Melt Casting Resins, Screw Driver Handle Stock, Finishing Compounds and others. Write today!

PLASTIC PARTS & SALES

1157 S. Kingshighway Blvd., St. Louis 10, Mo.

stress grades now available instead of the previous three.

The supplements may be obtained free of charge by writing the *Western Pine Association, 510 Yeon Building, Portland 4, Ore.*

♦ A group of New York University Industrial Arts students who are graduates of the New York School of Printing returned to their former school and presented an assembly program on March 20, 1957. The program included informatory talks and colored slides depicting industrial-arts shop activities. A quiz session followed the shop talks.

The participants were Ben Barbera, Philip Corneilson, Michael Conroy, Eugene Gardell, Victor La Place, Jerole Massone, Joel Brankel, and Ronald Hezel.

The faculty sponsors were Professors John V. Adams and Kenneth R. Benson.

♦ Thirty-two young Indian engineers have come to Chicago to study steel and iron production techniques as well as to learn about our way of life and see the city's sights.

The students, selected by the Indian government and steel industry, will play a vital part in the expected tripling of India's steel production by 1961. They will follow a weekly, year-long schedule of four days' training in steel production operations at United States Steel Corporation, with one day of classroom work each week at Illinois Institute of Technology, 35 West 33rd St., Chicago 16, Ill.

The over-all program has been made possible by a $1,500,000 Ford Foundation grant. Numerous steel companies and technical institutes in the United States are participants.

A second group of 15 students will arrive in Chicago November 30 and will receive technical training at Inland Steel Company and classroom work at Illinois Institute of Technology.

♦ The United States Civil Service Commission has announced examinations for filling Women Correctional Officer positions paying $3,670 a year, and Education Assistant positions in Agriculture, Industrial Arts or General Fields, paying $4,525 a year, for duty at various penal and correctional institutions throughout the country.

Full information regarding the duties of the positions and the requirements, and application forms, may be obtained at many post offices throughout the country, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted by the Board of U. S. Civil Service Examiners, U. S. Penitentiary, Leavenworth, Kans., until further notice.

♦ The Painting and Decorating Contractors of America, 540 North Michigan Avenue, Chicago 11, Ill., have published a revised edition of the book, "The Painting and Decorating Craftsman's Manual" — the official textbook used in all recognized apprentice training programs. The previous edition was published in 1949.

The instructional material has been revised and brought up to date with latest materials and methods. Among the innovations are chapters on the uses, advantages, and limitations of paint rollers and the new synthetic resins, including polyvinyl acetate, acrylic, and epoxy.

Acknowledged as the standard work on painting and decorating techniques, the P.D.C.A. craftsman's manual is so recognized by Labor and Management and has been used in higher courts as the authority to settle legal disputes over the uses or applications of painting materials.

The book is priced at $3 postpaid.

♦ The United States Civil Service Commission has announced an examination for filling Exhibits Technician and Exhibits Specialist positions in various federal agencies in Washington, D. C., and vicinity. The salaries range from $2,960 to $8,990 a year.

(Continued on next page)

A PRACTICAL AID IN THE TEACHING OF RADIO REPAIR

HHB RADIO INSTRUCTIONAL PANEL

. . . a means of teaching Radio "Trouble Shooting" to students under controlled situations

CLASSROOM-TESTED

Units have been used in actual classroom instruction during the past three years to simulate typical radio defects and show proper procedure to localize trouble.

These are results:

1. Assignments can be made more quickly and accurately under crowded classroom conditions.

2. Modern, practical, almost self-instructing by using sheets furnished.

3. Saves instructor's time in making "set-ups".

EASILY USED

Unit is furnished with ten "units of instruction" sheets. Twenty-five assignments are possible by using combinations of sheets. Knowledge gained of radio repair problems gives foundation for learning electronics and electronic circuits.

QUALITY-BUILT

A product of H. H. Buggie, Inc.—a leading electronics connector and components manufacturing company. Meets high standards in research, design and manufacture. Maintenance negligible. Operates as simple as a radio from 110-volt AC current.

COMPACT

Only 12 in. wide, 16 in. long and 7 in. deep. Weight 12 lbs. Natural finish plywood case. Instructional panel printed on white surface with yellow, orange, blue, red and green radio functional areas. Panel plastic-coated for long service life—cleanable.

FOR EQUIPMENT BUDGETS THAT ARE SMALL

The HHB Radio Instructional Panel costs less than $80.00 per unit. It is the lowest cost unit of its kind.

WRITE . . . for descriptive folder "How to Simplify and Speed-up the Teaching of Radio Repair." Also, please state number of students per class.

H. H. BUGGIE, INC.

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NEWS NOTES

(Continued from previous page)

Exhibits Technicians and Specialists perform or supervise work which includes the design, construction, installation, and maintenance of exhibits or models for educational, informational, scientific, or technical purposes.

To qualify for positions paying from $2,960 to $3,670, applicants must have had appropriate experience or education. For the higher-grade positions, appropriate experience or a combination of education and experience is required.

Further information and application forms may be obtained at many post offices throughout the country, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted until further notice by the U. S. Civil Service Commission in Washington.

New Publications

Printing and Allied Graphic Arts

By C. W. Hague. Cloth, 244 pp., 6¾ by 9 in., illus., $3.96. The Bruce Publishing Co., 400 N. Broadway, Milwaukee 1, Wis.

A fine text for giving beginning graphic-arts students quite a broad view of what the modern printing industry has to offer the world at large, and the workers who want to enter an industry that employs close to a million workers, and is classified as being third or fourth in size in the United States.

The book is well written and copiously illustrated.

The subject is divided into five parts, the first two of which treat of letterpress printing, the third treats other graphic arts processes, the fourth on covers, and bindery procedures, and the fifth describes related and technical information.

TV Repair Questions and Answers on Front Ends

By Sidney Platt. Paper, 122 pp., 5½ by 8½ in., illus., $2.10. John F. Rider Publisher, Inc., New York, N. Y.

This book aims to answer the questions which arise in the mind of the technician as he trouble shoots and repairs television receivers. Each answer gives specific step-by-step procedures for removing the trouble.

The Casting of Steel

Edited by W. C. Newell. Cloth, 599 pp., 6¼ by 10 in., illus., $27.50. Philosophical Library, New York, N. Y.

A comprehensive, technical treatment of the subject. The book is specially designed to provide steel founders and engineers with an authoritative guide on the technical aspects of producing steel castings.

The 13 chapters of the book present the subject under the following headings: properties of the liquid metal, the mechanism of solidification, the melting process, the use of refractories, patternmaking, mold preparation and coremaking, casting in sand, centrifugal casting, the investment casting process, heat treatment and properties of steel castings, mechanical testing — physical properties — specifications, radiography, and nondestructive testing (methods other than radiography).

Getting Started in Amateur Radio

By Julius Berens. Paper, 136 pp., 5½ by 8½ in., illus., $2.40. John F. Rider, New York, N. Y.

This book aims to teach anyone desirous of procuring his Novice Class license the necessary fundamentals of theory and the code. In fact the theory presented goes a long way in teaching the fundamentals required for even the General Class license. Details relating to receiver and transmitter theory are included. Special emphasis is made to acquaint the prospective applicant for the license with the FCC regulations.

Rider's Specialized Tape Recorder Manual (Volume 1)

By the Rider Laboratory Staff. Paper, 286 pp., 8½ by 11 in., illus., $4.50. John F. Rider Publisher, Inc., New York, N. Y.

This book contains the service information on the popular varieties of magnetic tape recorders produced from 1950 to and including the 1955 models.

The data has been obtained from the manufacturers, and therefore, furnishes the reader with the best servicing data and techniques obtainable.

Electricity and Electronics — Basic

By William B. Steinberg and Walter B. Ford. Cloth, 245 pp., 6¼ by 9¼ in., illus., $4.50. American Technical Society, Chicago, Ill.

A textbook which presents basic instruction in the theory and application of modern electricity and electronics for schools and training programs, as well as on-the-job trainees, hobbyists, and home craftsmen.

The increase in the variety of complex

(Continued on page 38A)

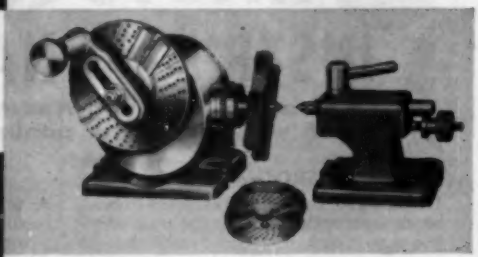
LW

America's Largest Builders of

DIVIDING HEADS

Accurate, Heavy Duty

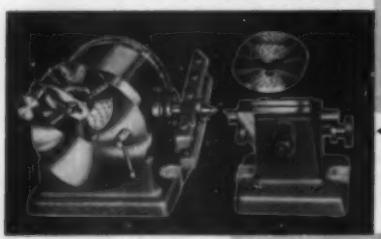
Ball bearing thrust on worm shaft and rear end of spindle. Headstock spindle has threaded nose. Large tapered bearing adjustable for end play. Head tilts past 90°. Worm wheel and alloy stress-proof steel worm cut to close limits for accuracy. Complete with three index plates for dividing all numbers to 50 and even numbers to 100 except 96T. Index chart shows all divisions obtainable to 380. Specify left (illustrated) or right hand model.



MODEL SD

6½" Swing. Spindle threaded 1½"-8. ⅝" table slot tongues. 36 lbs.

$175.00



MODEL BP

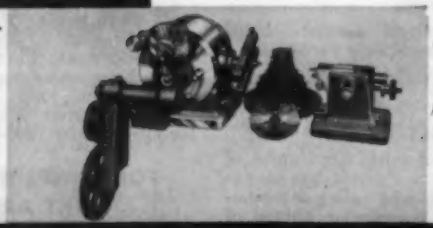
11" Swing for plain milling machine. Spindle threaded 2¼"-10. ⅝" table slot tongues. 140 lbs.

$295.00

MODEL AU

11" Swing. Fully universal for complete indexing and spiral cutting. Spindle threaded 2¼"-10. ⅝" table slot tongues. 190 lbs.

$460.00



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Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products

L-W CHUCK COMPANY

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1st PRIZE $300.00 cash
2nd PRIZE $200.00 cash
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Enter BRODHEAD-GARRETT's LUMBER CONTEST!

It's free — and open to all Shop Instructors and Directors. Nothing to buy — no rhymes or jingles to write. Just estimate the number of board feet in this load of fine Brodhead-Garrett high quality cabinet lumber. It was photographed just before it left for delivery to a school system somewhere in the U. S.

Contest closes December 1, 1957. Prizes awarded on basis of closest entry to actual count. In case of a tie for any prize, the one with the earliest postmark will be declared winner. Winners to be announced at a later date. Prize money will be mailed to winners December 15, 1957.

1st PRIZE: $300.00 Cash—2nd PRIZE: $200.00 Cash
3rd PRIZE: $100.00 Cash

Fill out and clip this coupon — send it before Dec. 1, 1957 to:

BRODHEAD-GARRETT CO. (Dept. IA)
4560 East 71 St., Cleveland 5, Ohio

I estimate _____ Board Feet of lumber in the load on the B-G truck.

Your NAME _____

TITLE _____ SUBJECT TAUGHT _____

SCHOOL _____

ADDRESS _____

CITY _____ STATE _____

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BRODHEAD-GARRETT CO.

4560 East 71 Street,
Cleveland 5, Ohio

Lumber, Industrial Arts, Vocational Education Machinery and Equipment

NEW PUBLICATIONS

(Continued from page 36A)

electrical and electronic devices employed today, both in industry and in the home, has produced a growing demand for highly skilled technicians and tradesmen. Besides this there are many laymen who want some quick inexpensive way to obtain familiarity with the fundamentals of electricity and electronics.

This book provides a general discussion of basic principles and their application to the major types of electrical apparatus now in use, from "Making Use of Magnetism" to the development of television and the use of geiger counters.

Discussions of basic principles of magnetism, current flow, wave propagation, etc., and their application to home electricity, electric motors, the telephone, television, etc., are followed by fascinating, inexpensive projects for the reader to build, providing demonstrations of the principles expounded. A light meter that can actually be calibrated for photographic use, transformer, a.c. motor, carbon mike, selenium power supply, transistor radio, are a few of the more than 50 carefully selected projects designed to create a permanent visual and conceptual understanding of basic principles.

American Trade Schools Directory 1957–1958

Compiled and edited by Ulrich H. E. Croner. Loose-leaf composition binding, 131 pp., 5½ by 8½ in., $9 a year. Croner Publications, Queens Village, N. Y.

FREE teaching aid

Helps students to learn the difference between minimum "Code" wiring and wiring that provides a home with full HOUSEPOWER. Simple, easy-to-understand; will encourage class discussion. The project has been specifically prepared by The National Adequate Wiring Bureau in response to requests by vocational teachers for material about adequate wiring.

ELECTRICAL PLANNING FOR TODAY'S HOMES is presented in the form of a series of true-false questions and answers. It interprets technical theory in terms of the householder's daily use of electricity, based on the standard contained in the Residential Wiring Handbook developed by the Industry Committee on Interior Wiring Design.

Send for this free teaching aid today.

National Adequate Wiring Bureau, 155 E. 44 Street, New York 17, N. Y.

Please send me free copy of teaching aid "Electrical Planning for Today's Homes."

Name_____
(Please print)

School_____

Street_____ City_____ Zone____ State_____

This loose-leaf book will greatly assist student counselors of high schools, colleges, universities, and librarians in their efforts to give our young people vocational guidance information.

The 2500 private and public trade, industrial, and vocational schools in the United States are listed by trades taught, and by states and cities.

The loose-leaf system used in putting this book together makes it possible to take on antiquated material, and insert new and supplemental sheets obtainable from the publishers.

Concrete Block Construction for Home and Farm

By J. Ralph Dalzell and Gilbert Townsend. Edward Matzke is a contributor to the second edition. Cloth, 216 pp., 5⅝ by 8½ in., illus., $3.60. American Technical Society, Chicago, Ill.

A book that will be of great assistance to journeymen, apprentices, vocational school students, vo-ag classes, and do-it-yourself enthusiasts.

The book contains seven chapters which describe mortar types, their properties and uses; concrete characteristics and mixing; concrete formwork; design and construction of footings; foundations and waterproofing; concrete masonry; and construction with concrete masonry.

Education and Industry at Work for Progress

Put out by the University of Cincinnati, Cincinnati 21, Ohio. Paper cover, 168 pp., 6 by 9 in., illus.

This booklet describes the observance of the 50th anniversary of the founding of cooperative education at Cincinnati. At the same time the anniversary celebration also honored Dean Herman Schneider (1872–1939), who was the originator and founder of the cooperative plan of education for "hitching theoretical knowledge and practical experience."

The contents of the book compares the times of 50 years ago with the progress made by business and industry since then. It also describes the panorama of progress exhibition which shows what co-operative education contributed to the progress of our country through the past half century.

Chair and Stool Seating

Paper cover, 34 pp., 5½ by 8½ in., illus., $1.15. Dryad Press, Leicester, through Chas. A. Bennett Co Inc., Peoria, Ill.

An interesting little text clearly written and well illustrated.

The materials (cane, rush, seating cord, and seagrass) are clearly described and their origin given. Then the various cane seating patterns are described such as the seven-step pattern, the chevron pattern, and the diagonal pattern.

Rush seating, seagrass and cord seating also are explained and shown by good, clear illustrations.

Problems in Mechanical Drawing — First Course

By A. S. Levens and A. E. Edstrom. Paper, 8½ by 11 in., illus., $2.20. McGraw-Hill Book Co. Inc., New York, N. Y.

This is the second edition of this workbook. It is keyed to French and Svensen's "Mechanical Drawing," and is a complete revision of the 1950 edition.

Each unit presents problems from simple to difficult so that problems may be selected to aid in the development of each student's ability.

Working drawing problems may be chosen

(Continued on page 40A)

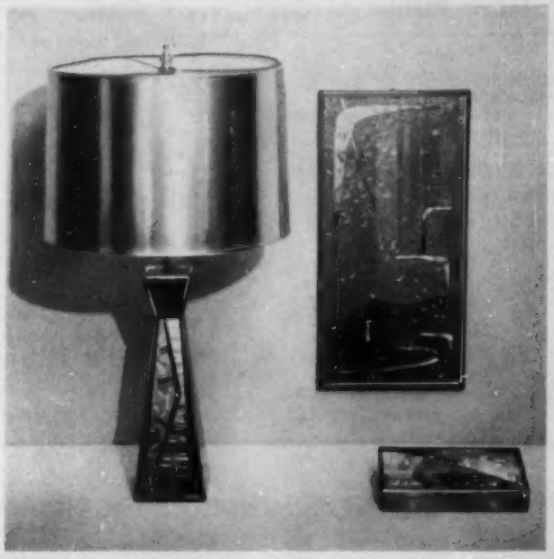
YOU CAN MAKE IT WITH Castoglas

HERETOFORE, all the experience and skill of a master craftsman would have been required to create the fine mosaic work illustrated here. Now, you and your students can cast your own colorful tiles and mosaics by merely mixing pigments and a Hardener with liquid Castoglas. Neither heat nor pressure are required. A catalyst hardens the resin alloy within 30 minutes at room temperature.

This new process is one of the most stimulating projects we have ever introduced to the schools. The adventurous teacher who loves to explore new materials and new ways of creating the unusual will find Castoglas an exciting challenge. And his enthusiasm will be shared by the students whether they are making murals, tile trays, contemporary jewelry or colored translucent room dividers. A lot of boys have a surprising aptitude for this work and many non-progressive students have responded quickly to the fascinating projects possible with these truly amazing materials.

Because of their versatility, the use of Castoglas resins and synthetic fibers is not confined to plastic courses. They combine beautifully with wood and metal, becoming either part of the finished article or being used in the process of fabricating.

HOW MUCH DOES IT COST? Let's start with the lamp and price each object on this page to give you an idea. The lamp base, including the wood, $1.50; mosaic wall panel, 95¢; jewelry box cover, 25¢; "glass" panel, 90¢ per sq. ft.; the paperweight, 50¢; key tags, 10¢ to 25¢; leaf tray, 75¢; tile trays, 25¢ to $1.25; mosaic table inlay, $2.50.



You can cast your own mosaics in an infinite variety of colors and your students can do it, too, without any previous experience. The Castoglas sets hard in 30 minutes at room temperature.

"How to Laminate Glass Panels with Castoglas" illustrates the fascinating art of creating decorative panels of your own design.

Embedding natural grasses, seahorses, starfish and shells in this glass-clear paperweight continues to be as popular as ever.

Key tags make fine take-home projects, inexpensive and easy to do. Brilliantly colored fall leaves are permanently embedded in Castoglas.

Seventh grade students are pouring colorful tile trays and coasters with liquid Castoglas.

Mosaic inlay in shades of blue-green adds distinction to this walnut table.

ILLUSTRATED DIRECTIONS SHOW YOU HOW

To help you make the most of these truly versatile Castoglas materials, we have prepared an excellent series of classroom-tested project manuals. You will also find them a stimulating source of new ideas. Each one is written with painstaking care to assure your success from the very start. Select your project copy from this list and mail the coupon with your remittance to

THE CASTOLITE COMPANY, Woodstock, Ill.

THE CASTOLITE COMPANY
Industrial Arts Dept. L-50
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- ☐ How to Cast Tiles with Castoglas .... 10¢
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- ☐ How to Earn Money in Your Spare Time ..... 10¢
- ☐ How to Use Castoglas in the School Shop ..... Free

☐ A complete set of THE CASTOLITER titles described here, plus two additional projects, will be mailed to you for only $1.00, postpaid.

Name _____ Position _____

School _____

Address _____

City _____ Zone _____ State _____

NEW PUBLICATIONS

(Continued from page 38A)

from the text, from models, or from actual machine parts.

At the back of the book are plates on vellum and on buff.

Basic Mathematics for Radio and Electronics

By F. M. Colebrook with additional chapters by J. W. Head. Cloth, 359 pp., 5⅛ by 7½ in., $6. Philosophical Library, Inc., New York, N. Y.

This is the third edition of this text which is wider in scope than the first two books, and includes much new material

The mathematics leads into calculus, linear differential equations, matrices, elementary statistics, and numerical computations. In spite of this formidable array, the subject has been made as simple as possible so that the student need not be afraid to tackle it.

Glass Reinforced Plastics

Edited by Philip Morgan. Cloth, 265 pp., 6⅛ by 9⅞ in., illus., $15. Philosophical Library, Inc., New York, N. Y.

This is the second edition of an interesting book which was first published in 1954. Since then, however, a number of developments have made it necessary to greatly revise and rewrite much of it besides adding three new chapters to bring it up to date.

The 18 chapters present the material under the following headings: glass fiber forms and properties; chemistry of unsaturated polyester and allyl resins; polyester types and properties; ancillaries for polyesters; glass fibers and phenolic resins; silicones, melamine, and purane resins; epoxide resins; commercial molding processing; methods of mass production; continuous resin injection for glass fiber molding; tube and rod production; design and properties of structures; glass reinforced plastics in the aircraft industry; glass fiber laminated in the electrical field; automobile bodywork and other transport applications; polyester/glass boat hulls; chemical engineering applications; miscellaneous applications; and an appendix on structural models.

Occupational Information

By Robert Hoppock. Cloth, 534 pp., 6¼ by 9⅛ in., $6.75. McGraw-Hill Book Co., Inc., New York, N. Y.

A book full of excellent directions for students and beginning counselors as well as for counselors who have experience in counseling procedures.

The book shows what a counselor should know about occupations, about sources of such information and of appraising, classifying, filing, and using occupational information.

The book contains a total of 27 chapters, some of which give suggestions for beginners, school and college administrators, and for college teachers.

The book also contains a revised and enlarged edition of the author's group guidance.

The appendix of the book contains helpful lists of publishers of occupational pamphlets, suggestions for discussion leaders, demonstration practice for job interviews, and assignments for counselors in training.

Occupational Information for Counselors: An Annotated Bibliography

The United States Department of Labor has issued a new pamphlet listing approximately 130 publications prepared by the Department, or by the Department in co-operation with another agency. It is designed for use primarily by counselors of young people, and represents one of the phases of the Department's program to help people select and prepare for occupations in which they may find the greatest personal satisfaction.

In addition to publications giving general occupational and industrial information for the use of counselors, the bibliography lists materials on specific occupations and industries, man-power studies and reports, career and employment planning, counseling and related techniques, and periodicals. Publications giving background information on apprenticeship; child-labor standards; and wages, hours, and related benefits are also included.

Copies are available at 15 cents each from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

TV Picture-Tube Chassis Guide

By the Rider Laboratory Staff. Paper cover, 72 pp., 5½ by 8½ in., $1.35. John F. Rider Publisher, New York, N. Y.

A book of great value to all technicians and to all parts distributors. It lists the picture tubes used in all TV receivers made since 1946. It is up-to-date in the listings inclusive of all TV receivers published in Rider's TV Volume 20.

The TV Chassis are listed in numerical order under each manufacturer, including private label. Accompanying each chassis listing are the one or more picture tube types used with that chassis. In some cases TV receiver models also are shown.

1957 Cars Fact Book

By Arthur R. Railton. Paper, 160 pp., 6½ by 9⅜ in., illus., 75 cents. Popular Mechanics Press, Chicago, Ill.

This book gives the specifications, prices, pictures, etc., of the 1957 cars, also prediction for 1958 cars.

It also contains 30 pages on foreign cars.

12" Swing No. 2525-V
Logan Screw Cutting Lathe

Brief Logan Lathe Specifications
SWING, 14⅜" down to 9" . . . CENTERS, 40" to 17" . . . COLLETS, 1" to ¼" . . . SPINDLE BORE, 1⅝" to 25/32"

Advanced Design Features
Ball Bearing Headstock . . . Variable Speed Drive on larger models . . . Double V-Belt Drive on smaller models . . . Automatic Safety Gear . . . Precision Carriage . . . 2-V-way, 2-flat-way precision ground bed, furnished flame hardened at small additional cost.

The Automatic Safety Gear neutralizes sudden overload shocks, automatically disengaging if the carriage or tool jams up, and thereby reduces breakage to all gears from the spindle through the quick change gear box and into the carriage. It is furnished as standard equipment with all Logan 12" and 14" lathes and may be ordered installed on new Logan 9", 10", and 11" lathes. The Automatic Safety Gear can be furnished for any quick change gear Logan Lathe already in your shop at a price of $10.00 for 9", 10" or 11" lathes and $15.00 for 12" or 14" lathes.

This protective feature that guards against mishaps and costly repairs is typical of the construction that makes Logan Lathes particularly suited to school shop usage. Furthermore, student interest is higher, instruction more effective, and progress faster when the class works with these modern industrial lathes. See your Logan dealer for full advanced design details, or write for the Logan catalog.

LOGAN ENGINEERING CO.
4901 WEST LAWRENCE AVENUE, CHICAGO 30, ILLINOIS

Pittsburgh COLOR DYNAMICS®

utilizes energy in color to improve efficiency and safety

That's why tomorrow's shopmen must know how to use this modern painting system to create better working areas

PITTSBURGH'S painting system of COLOR DYNAMICS is being included in many of today's courses in vocational training. This is the natural result of the growing recognition of the contribution that functional use of color is making to improve the efficiency, safety and morale of workers.

• **Tomorrow's shopmen** are being shown how the principles of COLOR DYNAMICS, applied to structures and equipment, provide a more pleasing environment and help workers see their jobs better.

• **An excellent example** of such results is the new plant of the George L. Nankervis Company, of Detroit, Michigan, makers of quality control equipment for the automotive and aircraft industries.

• **In this plant,** eye fatigue, so often the cause of lowered efficiency, is lessened by the use of eye-rest colors on walls and machines. Morale-building colors promote cheerfulness on the job. Safety colors on motorized equipment and traffic lanes reduce danger of time-loss accidents.

• **Why not equip your** students to be better shopmen tomorrow? Teach them the principles of COLOR DYNAMICS. Better still, give them practical demonstrations on how to use the energy in color in your classrooms and on your equipment.

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• Write today for a copy of the free booklet which explains how COLOR DYNAMICS can be applied in industry. Better still, we'll be glad to prepare a detailed color plan of your classrooms and equipment, without cost or obligation. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have a representative see you. Or mail coupon at right.

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Department IA-107, Pittsburgh 22, Pa.

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BERGER "ALL-IN-ONE" DRAFTING KITS

All needed drafting tools in one easy-to-carry case.

Instructors like the way these all-in-one drafting kits bring students to class fully-equipped with every tool they need. Sessions get under way promptly without students begging the loan of a neighbor's protractor, a triangle, a scale.

Students welcome the way all their drafting tools are zipped up in one easy-to-carry case — easier to bring everything to class than leave any at home. It costs so little — in some cases less than buying the items individually.

You'll agree it's today's indispensable teaching aid — and learning aid, too. Tell your students about Berger Drafting Kits.

Recommended and used in hundreds of schools.

BERGER DRAWING SET #510 Complete — high-grade scholastic set; in velvet lined case. Price including complete kit — $10.50. T-710A With interchangeable nickel silver master bow — $8.27.

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Protractor	French Curve
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Inner compartments hold drawing and note papers — all in attractive, durable 16" x 24" simulated leather 3-way zippered carrying case of scuff-proof, water-proof Texon with slide-in type handles.

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HIGGINS SUPER BLACK
for artwork with brush and pen

HIGGINS ACETATE BLACK
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Business and Personal News

FIFTIETH YEAR IN HARDWARE INDUSTRY

H. F. Seymour, president of The Columbian Vise & Mfg. Company, has recently observed the fiftieth anniversary of his entrance into the hardware industry. There was no special ceremony to mark the day. Mr. Seymour was "out on the road" selling with the vigor and enthusiasm that has made Columbian the world's largest builder of vises.

Mr. Seymour's association with The Columbian Vise & Mfg. Company dates back to 1912. Prior to that he had been connected with the hardware business for five years with an Asheville, N. C., firm which mined and processed mica for sale through the nation's hardward wholesalers.

During his 50-year career, Mr. Seymour has been accorded practically every honor that the hardware industry can bestow upon its leaders.

NEW TEAM TO INCREASE SCREW MACHINE EFFICIENCY

Two Brown & Sharpe engineers, well known to the screw machine industry, now form a team whose purpose is to better the efficiency of Brown & Sharpe Automatic Screw Machine production in customers' plants.

Walter E. Rollins, supervisor of screw machine sales projects, and his assistant, Oscar T. Lippman, have long specialized in automatic screw machine applications. Operating in the field, these men will offer if found necessary, an "on-the-job" study of customer problems, helping them secure maximum efficiency, reduction of production costs, and elimination of secondary operations wherever possible. Under the direction of the director of screw machines sales they will strengthen existing customer training programs and eventuallly add additional courses for training screw machine specialists.

BLACK & DECKER OPENS NEW BRANCH

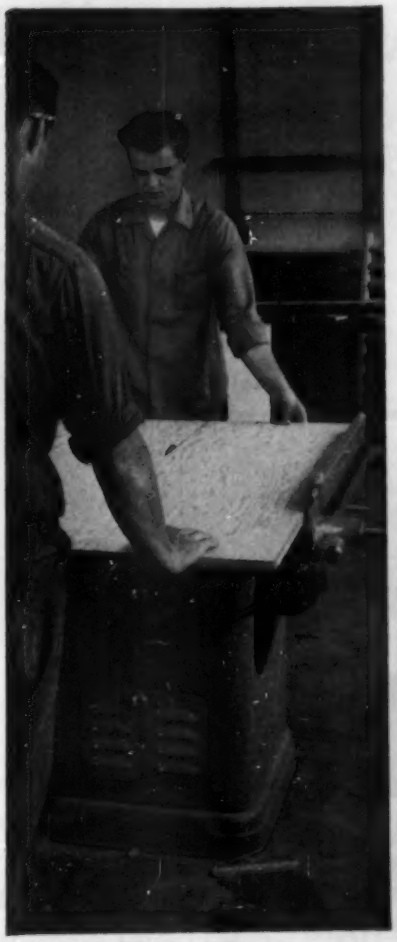
The Black & Decker Manufacturing Company announces the opening of a new factory service and sales branch in Hartford, Conn., located at 33 Webster Street. The branch will serve users in an area extending as far as Springfield, Mass., and New Haven, Conn.

This is the 43rd factory service branch opened by Black & Decker in the United States. They are the world's largest maker of portable electric tools, with headquarters in Towson, Md.

MARION COLSTON JOINS BERGEN ARTS & CRAFTS

Bergen Arts & Crafts announces the addition of Miss Marion Colston to their staff. She is a well-known Cleveland enamelist and teacher. Miss Colston will conduct classes in the techniques of copper enameling and jewelry-making.

The U. S. Army has 22 permanent arsenals for developing weapons and equipment required today or for possible exigencies of the future. — *Wisconsin Military Information Section.*



Your students will enjoy building any of these interesting projects. The clear, easy-to-follow plans—plus big easy-to-work panels—make for professional-like results when you use

FIR PLYWOOD

Look for DFPA trademarks—your assurance of DFPA quality-tested fir plywood. PLYPANEL is versatile one-side grade of interior-type fir plywood. For all outdoor uses, insist on EXTERIOR-TYPE; the EXT-DFPA on the panel edge is your positive identification.

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for classroom projects

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to industrial arts instructors

CHECK PLANS YOU WANT—
MAIL COUPON—THAT'S ALL!

☐ UTILITY TABLE	☐ CHILD'S TABLE AND STOOLS	☐ PATIO FURNITURE
☐ STACKING CABINETS	☐ BUNK BED	☐ ODDS 'N ENDS CABINET
☐ BUFFET STORAGE CABINET	☐ BOAT BED	☐ 5' SAILER
☐ UTILITY SHELVES	☐ TRAIN TABLE CABINET	☐ 15' SAILBOAT
☐ TOOL-CABINET WORKBENCH	☐ COVERED SAND BOX	☐ 20' SAILBOAT
☐ DOUBLE DUTY DESK	☐ TOY STORAGE BLOCKS	☐ 11'3" OUTBOARD
☐ COFFEE TABLE	☐ PORTABLE GARDEN CADDY	☐ 9' FLAT BOTTOM DINGHY
☐ BEDSIDE TABLE	☐ SECTIONAL PATIO TABLES	☐ 7'9" PRAM DINGHY
☐ STUDENT'S DESK	☐ OUTDOOR SERVING WAGON	☐ 13'4" OUTBOARD
☐ CHEST OF DRAWERS		☐ 13'6" INBOARD RUNABOUT
☐ TWO-DOOR CABINET	☐ SUN SLED	☐ HOG HOUSE
☐ TV STOOLS	☐ GARAGE STORAGE BOX	☐ POULTRY HOUSE
☐ CHILD'S TUMBLER	☐ GARDEN CABINET	☐ ROLL-AWAY POULTRY NEST

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Without obligation or charge, please send me a copy of the plans I have checked above.

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SCHOOL _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____ (Good in U.S.A. Only)

Descriptive Material

CIRCULAR DESCRIBES LATHES

Sheldon Machine Co., Inc., announces a new circular illustrating and describing its new series of 11-in. and 13-in. Variable Speed Precision Lathes.

The circular contains complete specifications and detailed information on the new variable drive and other modern design features of these lathes. These new lathes provide automatic power selection of spindle speeds from 40 to 2000 r.p.m. Speeds are read on a built-in tachometer in the headstock.

A special section is devoted to some of the many production accessories that are available to increase the versatility of these new Variable Speed Lathes.

(For Convenience Circle Index Code 0820)

"DESIGNS FOR LABORATORY LIVING"

"Designs for Laboratory Living" is a new book published by The Standard Electric Time Company. In the book's 120 pages, Standard Electric describes installations of its Flexlab voltage distribution systems in more than a hundred college laboratories.

The book will be helpful to all engineering directors who may be planning new laboratories or additions to present facilities. In addition to providing up-to-date information on electrical equipment, the book clearly shows the modern trend of laboratory design including lighting, layout, machinery, etc.

The Standard Electric Time Company, the pioneer and largest producer of experimental power distribution equiomment, will send a copy free of charge to college administrators and department heads and to school architects and engineers.

(For Convenience Circle Index Code 0821)

COPPER ENAMELING PAMPHLET

A new pamphlet entitled "Copper Enameling with the Air-Acetylene Torch" is now available from Linde Company, Division of Union Carbide Corporation.

This booklet gives a detailed description in words and pictures of the copper enameling process with the air-acetylene torch. It lists the tools necessary; gives step-by-step methods of doing projects; and tells how to use the air-acetylene torch easily and economically.

A free copy of this booklet may be obtained by writing for it. Ask for Form 1085.

(For Convenience Circle Index Code 0822)

GILBERT & MILLER, INC., CATALOG

A new free catalog has been prepared by Gilbert & Miller, Inc. In addition to the many desk fountain pens, desk ball pens, desk pencils, and swivel-funnel holders which they have heretofore featured, there are many new items which will be of interest to shop instructors.

These new project accessories which are recommended as supplements to work in leather, wood, plastic, metal, and ceramics, consist of glass timers, clocks, barometers, thermometers, perpetual calendars, letter opener blades, and handles. Suggestions for the application of a number of these materials are included.

For your copy of this catalog write to the manufacturer.

(For Convenience Circle Index Code 0823)

NEW DUST CONTROL BULLETIN

American Air Filter Company, Inc., have issued a completely new product bulletin describing the Type W Roto-Clone, a dynamic precipitator. The new 16-page bulletin discusses the operation of the Type W Roto-Clone dust collector in detail, including various arrangements.

The bulletin explains the Type W's distinguishing feature, the addition of a water spray to the basic principle of dynamic precipitation. Other features of the new bulletin are wiring diagrams, 23 performance tables, exploded view of the shaft assembly, engineering data, pipe resistance chart, erection diagrams, drawings showing venting of secondary air, tables for normal water supply rates, shipping and operating weights, dimensions for sludge settling tanks, and humidifying efficiency graphs.

Dust control Bulletin No. 274B is available without charge upon request from American Air Filter Co., Inc.

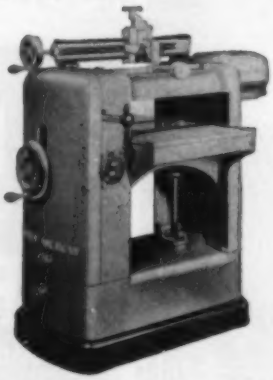
(For Convenience Circle Index Code 0824)

"A NEW APPROACH TO SAW GUARDING"

Brett-Guard Company will furnish their new 16mm. film safety demonstration entitled "A New Approach to Saw Guarding" on a loan basis. It is a sound film, running time 15 minutes.

The demonstrator shows how Brett-Guard has achieved the best saw guard on the market, because as a multi-purpose production saw fixture the visual accessory tool is designed to be a useful accessory fixture to further extend the versatility and application of its exclusive safety features. It provides a safe and efficient fully adjustable method of mak-

(Continued on page 46A)



Finest Surfacer Available: Yates American J-180 handles stock up to 18" wide, 1/8" to 6" thick. Convenient index lever provides the speed you need for a high quality finish — 18 to 55 FPM. Controls are easy to reach, adjustments easy to make. Available with either 3HP or 5HP motor mounted directly on cutterhead arbor. An outstanding quality value at **$995** with 5HP motor.

Tops in industry, too:
Yates-American Surfacers are used by famous producers of pre-finished flooring.

12" LATHE

10" SAW

8" JOINTER

20" BAND SAW

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Dept. L, 721 N. Fourth St., Beloit, Wis.

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and COLORFUL CORD

Our webbings and cords are designed, styled and tested expressly for modern furniture applications. Full range of decorator colors and textures. Cottons for interior furniture, and weather resistant woven plastics for terrace or outdoor use. **Send for complete set of swatch books.**

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Complement Craftsmanship

WITH FLATTERING COLORS AND RICH TEXTURES FOR DECORATOR FURNITURE YOU ARE PROUD OF

WEBBED FURNITURE PATTERNS

To the many who have asked us where they can obtain patterns for making colorful modern WEBBED FURNITURE, we are pleased to suggest the following sources:

U-Bild Enterprises, Van Nuys, California

Pattern #93—Indoor Contour Chair (75¢)
Pattern #116—Hostess Chair (50¢)
Catalog #54—"Make It Yourself" (25¢)
Pattern #106—Occasional Chair (50¢)
Pattern #126—Occasional Stool (50¢)

Easi-Bild Pattern Co., Pleasantville, N. Y.

Pattern #92—Modern Chair (35¢)
Pattern #548—Modern Web Chair (50¢)
Pattern #311—Modern Folding Lawn Chair (35¢)

Fawcett Books, Dept. 215, Greenwich, Conn.

Book #215—"Build Your Own Modern Furniture" (75¢) By Klaus Grabe
Book #339—"How To Build It," Webbed Chair, page 54 (75¢)

Fawcett Publications, Greenwich, Conn.

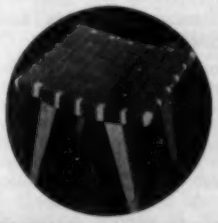
"Mechanix Illustrated"—Nov., 1955, **Webbed Chair**
"Mechanix Illustrated"—July, 1956, **Web Chair**

Delta Power Tool Division, Rockwell Manufacturing Co., Pittsburgh 8, Pa.

"Projects For Outdoor Living"—Catalog #4713, page 84, Outdoor Chairs ($1.00)
"Things To Make"—Catalog #4710, page 35, Light Weight (Cord) Chair; page 36, Modern Web Chair ($1.00)

Home Craftsman Magazine, 115 Worth St., New York, N. Y.

March-April, 1954, page 15, Graceful Webbed Chair (50¢)
July-August, 1954, page 15, Webbed Aluminum Lawn Chair (50¢)
May-June, 1950, page 13, Webbed Living Room Chair (50¢)



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Vocational education departments, equipped with VEMCO professional size drafting machines, are training students with the same type of drafting equipment industrial employers will expect them to use.

Built for Long Service
Permanently sealed ball bearings.
Pulleys and housings machined die castings.
Hardened steel, ground index plate.
Steel bands — continuous, no joints.

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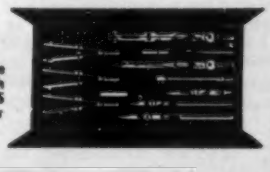

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Contents: What is automation? Automatic controls. Pneumatic control devices. Hydraulic control devices. Electrical and electronic control devices. Automation in materials handling and assembly. In production of ferrous and non-ferrous metals. In metal casting. In mechanical working of metals. In machine tools. In heat treatment. In welding, brazing and joining. In testing, inspection and quality control.

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Detailed, lucid treatment of the tools and techniques of the art of forging $3.95
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Functional, stimulating approach to teaching the math needed for industry through the use of actual shop problems . . . $5.50

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Address .....
City ..... Zone .... State .....

DESCRIPTIVE MATERIAL

(Continued from page 44A)

ing various "heretofore" impossible-to-guard types of cuts.

With Brett-Guard in place on a circular saw, the instructor shows how the Brett-Guard Safety Guard protects operators so they can "see and saw" in such dangerous operations as mitering, cross cutting, compound mitering, ripping, and demonstrates how Brett-Guard safely protects the operator in the "unguardable operations" such as rabbeting, tenoning, dadoing, feathering, diagonal sawing, template cutting, drop sawing, plowing and tonguing. Also the demonstrator shows the use of Brett-Guard as a safety tool where production efficiency is required.

In order to schedule this training film, please write to the Brett-Guard Company.

(For Convenience Circle Index Code 0825)

BIBLIOGRAPHY ABOUT ALUMINUM

Aluminum Company of America announces the "Bibliography of Information About Aluminum for the Designer," which has been made available by their library. All available Alcoa literature and motion pictures of possible interest to designers and design engineers in the metalworking industry are discussed in this booklet. The final two pages include forms to simplify ordering of literature.

Copies are available upon request.

(For Convenience Circle Index Code 0826)

BERGEN COMPANY CATALOG

Bergen Arts & Crafts have just issued a completely new 112-page catalog. It is fully illustrated, with large sections on copper enameling and supplies, jewelry findings, and settings for all types of jewelry-making with gems or shells. Included, also, are the latest ceramic decorating and "boutique" supplies. The catalog is furnished free when requested on school or business letterheads; otherwise twenty-five cents.

(For Convenience Circle Index Code 0827)

LAMP PROJECTS FOR INDUSTRIAL ARTS

Plans for lamp projects, designed to provide good lighting as well as worth-while shop experiences, are published by Better Light Better Sight Bureau, a nonprofit organization devoted to furthering a better public understanding of the relationship of light and sight.

Projects are provided which are suitable, from the standpoint of skills and equipment, for each age group from junior high through high school.

In addition, suggestions are made for the use of different materials: metal, wood, and ceramic.

Along with plans for the lamp and fixture projects are suggestions on how to incorporate the principles of good lighting for seeing. A Handbook for Shop Teachers (also useful as reference material in the Shop Planning Library) provides additional facts about light and lighting.

The whole program is titled "Working with Light." Teachers interested in procuring the materials should inquire at their local electric power company, or write Better Light Better Sight Bureau.

(For Convenience Circle Index Code 0828)

CORRESPONDING CODE INDEX NUMBERS TO BE ENCIRCLED CAN BE FOUND ON THE CARDS IN THE READER'S SERVICE SECTION.

Hotpack PLASTIC PRE-HEATING EQUIPMENT
Electric PORTABLE OVEN

No. 600

For preheating Methyl Methacrylate in sheet or rod form where it is necessary to maintain even temperature throughout the sheet, especially desirable in compressed air, vacuum or pressure forming techniques.

The Oven is controlled by a newly developed thermostatic control, sealed in and conveniently placed on the front panel, of the Oven. It can accurately be set at any desired temperature where a quick rate of heat up to 306° F. is desirable.

Due to the Aluminum Construction, the Oven is very light in weight and can be carried from room or project to project. As it operates on 110 volt AC or DC, it can be plugged into any 110 volt receptacle.

SPECIFICATIONS

Model	Interior Size	Wattage 100 AC-DC	F.O.B. Phila. Price
600	12"Wx12"Dx12"H	700	$ 90.00
602	24"Wx12"Dx12"H	1400	140.00

Send for complete details

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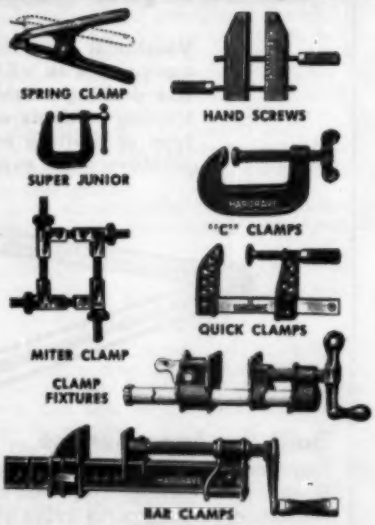
5067 Cottman Ave Philadelphia 35, Pa.

HARGRAVE
The Complete Line of Tested TOOLS



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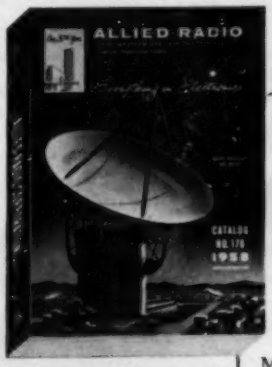

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DURABLE
ECONOMICAL

PARENT

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No. 36-285B

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Here's a drawing table that will solve your equipment problems! All steel constructed, this table is 40″ high and is equipped with a stationary 36″ x 28″ steel top with book well in front apron. Table can be furnished as shown with six-drawer Unit and Drawing Board Storage Cabinet, or with only one of these units. Also available as basic Drawing Table without cabinet or drawer units. A complete line of drawing Tables is illustrated in the NEW "PARENT" SCHOOL SHOP EQUIPMENT CATALOG — SEND FOR YOUR COPY TODAY!

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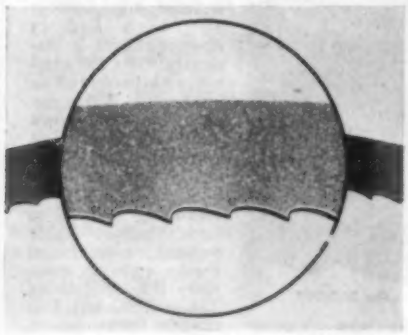
Shop Equipment News

STARRETT HIGH SPEED STEEL BAND SAW

A series of important developments resulting from intensive research have made possible the introduction by The L. S. Starrett Company, of a new band saw with phenomenal performance characteristics.



New Starrett Safe-Flex High Speed Steel Band Saw

These developments include: (1) recent perfection of methods of producing high speed steel in thin strip suitable for band saw stock; (2) new heat-treating methods which permit controlled hardness graduating from a super-hard cutting edge to a super-tough, flexible back; (3) advancements in welding techniques which make possible welding high speed steel saw stock into bands with the weld as strong as the parent metal.

The result is the Starrett Safe-Flex High Speed Steel Band Saw, a continuous cutting tool of highest quality high speed steel with extremely hard teeth for cutting at maximum speeds and feeds combined with a back that has complete flexibility and extra toughness for safety and long life.

An important characteristic of this new high speed steel band is its ability to retain hardness even up to red-heat temperatures of 1100 deg. F. Combined with the higher tensile strength and toughness, this permits greater tensioning, heavier feeds and faster speeds for cutting the hardest and toughest materials.

Thicknesses of these new bands range from .025 in. to .042 in. They are available through industrial supply distributors in regular, hook-tooth, and skip-tooth types in four widths and a wide variety of pitches.

Complete information including specifications and recommendations for selection and use are available on request.

(For Convenience Circle Index Code 0801)

NEW BROWN & SHARPE SINE PLATE

A reliable means for establishing precise angles for surface grinding, toolmaking, and inspection is provided at surprisingly low cost by the new Brown & Sharpe No. 925 5-in. Sine Plate. With an over-all accuracy within .0002 in., it gives angular settings gauge block accuracy.

No. 925 is made of normalized steel, case hardened and aged, with glass-like finish on bottom, top, and sides.

The end plate is held in place by three knurled-head screws and the sine plate itself

No. 925 5-in. Sine Plate

has tapped holes in its sides, ends, and top for application of special plates or other holding devices.

The working surface of the hinged plate is 3½ by 6 in. Center distance between rolls is 5 in.

Illustrated literature is available upon request.

(For Convenience Circle Index Code 0802)

THE ULMIA WOOD SCRAPER BURNISHER

The H. L. Wild Company have made available their ULMIA Wood Scraper Burnisher, which every expert will appreciate. No wood workshop should be without a good scraper for finishing surfaces of all kinds.

ULMIA Wood Scraper Burnisher

The ULMIA Burnisher for Wood Scraper Cutting Edges enables every carpenter and cabinet maker to give to his scraper guaranteed even cutting edges within a few seconds.

Moreover, the edges will retain their good cutting properties for a surprisingly long time, which will make the scraper a popular tool, whereas hitherto the setting and burnishing of scraper cutting edges required not only much time and effort, but also a considerable amount of skill on the part of the woodworker.

It consists of a wooden handle (steel holder) and a turntable mounted steel disk. A steel angle section with a recessed corner serves as a guide for the scraper blade and at the same time protects the formed cutting edge.

Detailed instructions for preparing the scraper blade and for forming the cutting edge by means of the burnisher, are available.

(For Convenience Circle Index Code 0803)

CORRESPONDING CODE INDEX NUMBERS TO BE ENCIRCLED CAN BE FOUND ON THE CARDS IN THE READER'S SERVICE SECTION

NEW ABRASIVE

Skil Corporation, portable power tool manufacturer, has placed on the market four new tools which the company expects will be welcomed by the industrial-arts school shops because of their safety features, material-cost economy, and all-round performance.

Perma-Grit Hand Sander

The tools fabricated from a new abrasive developed by and exclusive with Skil are:

1. A circular saw blade that cuts, sands, ploughs, dadoes, contours, and can be used in jointing operations. The blade is so safe that Skil engineers hold a finger against the rim of the blade rotating under power without injury. Because the rim of the blade is covered with tiny grits instead of conventional saw teeth, it does not grab and tear as saw teeth will. This same feature virtually eliminates "kickback" of work.
2. Sheets, plates, and disks for powered stationary and portable sanders.
3. A hand sander, which "never wears out."
4. A file which will cut in forward and back strokes, sideways, and in circular motions as it quickly removes stock in smoothing, shaping, and notching operations. The wide spacing of the grits on the file makes for a self-cleaning action, thus minimizing loading.

Further information is obtainable.

(For Convenience Circle Index Code 0804)

NEW LIGHTWEIGHT KLEEN-UP CART

Can-Pro Corporation, manufacturers of school aprons and coats, have designed especially for use in the school shop, a new, strong, but lightweight spring steel cart to make "shop clean-up" fun and good training

New Lightweight Kleen-up Cart

for the boys. It has a convenient handle and rear wheels for easy rolling. The big capacity flame-resistant bag attached to or removed from the cart in seconds, features no hooks,

(Continued on page 50A)

More than 2000 Wood Shop Instructors Look to

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1. *Burns all types of gas.* Clean and efficient.
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The firebox is 5½" wide, 7½" deep, 27" long. Heavily insulated. Four burners. Convenient Gas and Air adjustments. Adjustable swinging refractory lid, adjustable rack and A.G.A. solenoid safety valve.

Also available in smaller firebox size.

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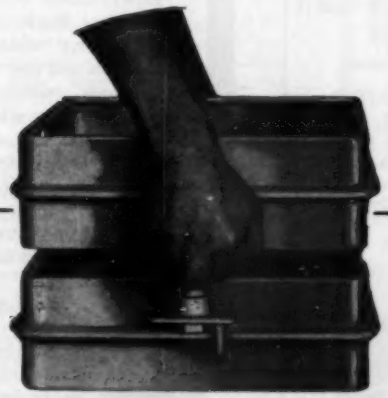

Sterling Style "E" Flask

You'll find Sterling Style "E" Flasks exceptionally easy to handle because pin lugs are combined with handles. In many foundries, these Style "E" Flasks have replaced snap flasks. They prevent runt outs . . . require less sand. Sterling Steel Flasks combine maximum strength with minimum weight. They retain their rigidity and accuracy, year-in, year-out. Write for Sterling Catalog.

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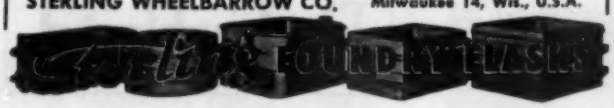

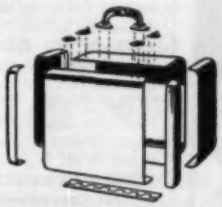

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Multipurpose Tray Kit #3 Size. Fits 17" x 8" Utility Case

Captain's Case Kit #4 Size 13½" x 12" x 5½"

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SHOP EQUIPMENT NEWS

(Continued from page 48A)

clamps, ropes, etc., but is held wide open by the simple tension of the spring steel frame.

The Kleen-Up Cart is easy to move down narrow aisles, between benches, and machinery, is provided with fixtures for attaching broom and dustpan, and the bag has large pockets for brushes, cleaning rags, etc.

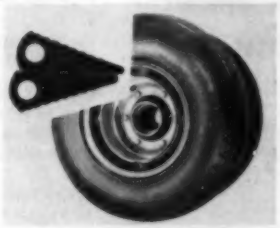
Complete information available.

(For Convenience Circle Index Code 0805)

DRUM SILENCER WEDGES

Barrett Equipment Company have made available their Drum Silencer Wedges, No. 195. They are made of special tempered rubber for driving between wheel rim and brake drum to prevent chatter while machining drums with wheels attached.

Unique notch design serves as a lock, and also permits nesting of two wedges together for use between drums and tire rims where space is greater than thickness of one wedge. Holes provide for easy removal after machining.



Drum Silencer Wedges

The common practice of driving wooden wedges between drum and wheel rim causes drum distortion resulting in a series of low areas in the face of the machined drum. Use of the new rubber wedges eliminates this problem.

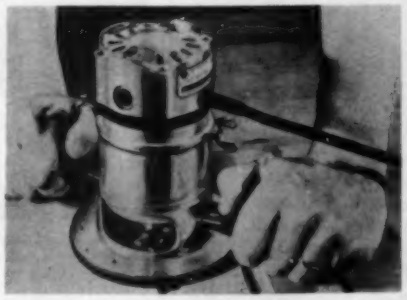
The Barrett Drum Silencer Wedges are ideal for machining both passenger car and truck drums. Packed four to the set. Wedges taper from 5/16 in., to 1¼ in.

Full information available.

(For Convenience Circle Index Code 0806)

BLACK & DECKER 1-H.P. ROUTER

The Black & Decker Manufacturing Company have announced a new 1-h.p. Heavy-Duty Router. Designed to perform the finest intricate joinery and cabinet work, the router features a micrometer-type depth adjustment for accurate, quick setting, and many exclusive features for ease of handling. It is



New Black & Decker One-Horsepower Router

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powered by a special Black & Decker-built motor. Since the unit operates by direct drive, no gears are necessary and speeds range up to 22,000 r.p.m. Additional built-in features include heavy-duty ball bearings which are permanently lubricant-sealed and a positive grip collet-type chuck. The chuck is tightened with two wrenches which are supplied as standard equipment.

The router is a woodworking tool that rapidly accomplishes inlay work, decorative edges, and many types of bas-relief carving and wood finishing, in addition to such fine cabinet work as beading, grooving, routing, fluting, cove-cutting, and dovetailing. For purchase with the router, there are nearly 100 different bits and cutters. In addition, there are several combination kits and attachments available.

A special 40-page Router Manual is available from the manufacturer for fifty cents.

For additional information please write to the manufacturer.

(For Convenience Circle Index Code 0807)

WIREMOLD POWER OUTLET STRIPS

Wiremold electric outlet sections which can be quickly installed on any of its line of Hallowell shop benches are now being offered by Standard Pressed Steel Company.

Sections are pre-wired and complete. No makeshift wiring is needed to put power on tap safely at bench-top level. It is only necessary to bring in lead-in wiring of armored cable or conduit for the bench to be electrified.

Wiremold Power Outlet Strips

Sections have Underwriter's approval for 15 a., 125 v. service. Wiremold sections provide individually-grounded, 2-wire NEMA receptacles with three-prong, double-wipe contacts every six inches. The strips can be mounted to lie flat along either vertical or horizontal surfaces on the front or back of the resinwood, pressed-wood, laminated wood, or metal bench tops.

Any Hallowell bench, whether of cabinet, unit or open construction, can be equipped with the Wiremold sections.

More complete information is available.

(For Convenience Circle Index Code 0808)

PENCIL SHARPENERS AND POINTER

If your needs require a universal type pencil sharpener and pointer, then Alvin & Company can offer you a 4-blade, 4-action complete combination in one.

Blade 1 shaves only wood, shaving wood and graphite through automatic stops; blade 2 sharpens only lead to a very fine point with little breakage; blade 3 sharpens artists' pencils, propelling pencil leads and press-top pencil leads up to 3 mm. in diameter; and blade 4 services the same as blade 3, but only up to 2 mm. diameters.

The body holds extra blades of the finest Swedish steel, and the new style transparent

(Continued on next page)

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Invaluable training course for TV instruction. 24-Lesson Section covers oscilloscope principles and application; power supplies; FM carrier waves, discriminators, ratio detectors; antenna principles and design; TV receivers; RF amplifiers and tuners; Video IF, detector, AGC and sweep circuits; cathode ray picture tubes, etc. Project Section includes nine basic projects translating theory into actual practice and so designed as to sustain interest. This effective TV manual contains 280 pages; 7½ x 11"; fully illustrated. Order *ED-21*, only.....$5.00

COLOR TV TRAINING MANUAL

For advanced students. Covers principles of the Color TV system, including colorimetry, make-up of the color signal; Color receiver circuits (chapters on every type of circuit used in the receiver); Color receiver servicing, including setting up the Color picture tube, alignment, trouble-shooting, test equipment required; also valuable appendices containing equations, vectors, color blocks and colorplates. A comprehensive Color TV training course. 260 pages; 8½ x 11"; profusely illustrated. Order *TVC-1*, only $4.95

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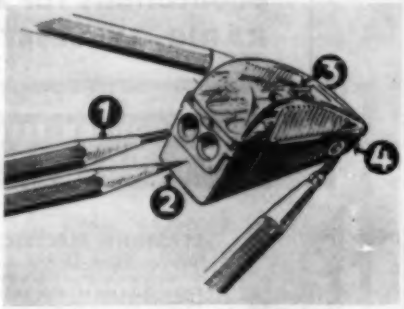
SHOP EQUIPMENT NEWS

(Continued from previous page)



"Universal" 4-Way Pencil Sharpener

top collects shavings that can be removed when full, without dirtying your hands.

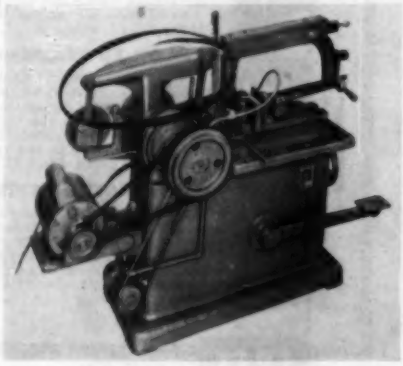
Alvin & Company also offers a "Super" 2-way pocket pencil sharpener with the same new style transparent shavings container and glass-hard Swedish steel blades engineered to save waste. It is convenient to carry in your pocket, purse, or briefcase. This pocket sharpener is clean, compact, lightweight, and can be relied upon anytime, anywhere.

Both the "Universal" and the "Super" pencil sharpeners are individually boxed in attractive cartons.

(For Convenience Circle Index Code 0809)

IMPROVED POWER HACK SAWS

Faster cutting is made possible on Keller Power Hack Saws by an improved guide bar support arm and guide bar, as announced by Sales Service Machine Tool Company.



Keller Power Hack Saw

The new guide bar support arm has been redesigned to give greater rigidity and this together with a heavier guide bar allows more pressure to be applied to the saw blade. Cutting time is reduced materially as a result.

This improvement has been incorporated into five Keller Power Hack Saws. These include Models No. 3B Dry Cut 6¼ by 6¼ in., No. 3C Wet Cut 6¼ by 6¼ in., No. 3CH Wet Cut 6¼ by 6¼ in., No. 4 Hy-Duty 8½ by 8½ in., and No. 5 Hy-Duty 10½ by 9 in.

Complete information is available.

(For Convenience Circle Index Code 0810)

NEW CHALLENGE FILING CABINETS

Challenge Machinery Company have introduced their new all-steel Challenge Filing

(Continued on page 54A)

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BASIC SCIENCE
(PHYSICS)
By OLIVO and WAYNE

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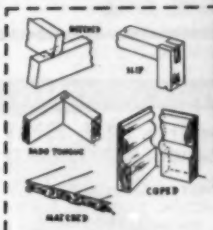

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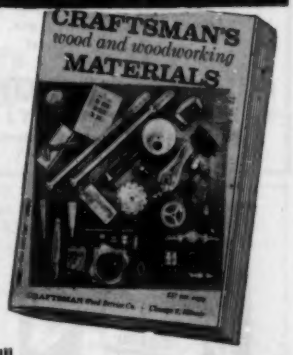

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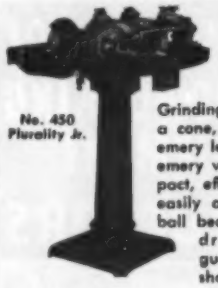

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SHOP EQUIPMENT NEWS

(Continued from page 52A)

New Challenge Filing Cabinet

Cabinets for the handy filing of offset and duplicator plates or flats, drawings, artwork, photographs, paper samples, engravings, or cuts. The drawers, which are 25 in. wide, 22 in. long, and 1½ in. deep, provide ample space for most filing requirements.

The cabinet is finished in an attractive gray metallic finish. Each drawer supports 200 lb., and rolls easily on steel ball bearings. The spacious, easy sliding drawers are dust-resistant to keep contents clean with index tabs for speedy reference. The top provides extra working area. The cabinets are 29 in. high over-all including a 4-in. base. Additional cabinets without top and base are available where "stacking" of the units to double height is desired.

Complete information available upon request.

(For Convenience Circle Index Code 0811)

CIRCULAR SAW WITH INCREASED CAPACITY

Yates-American Machine Company have increased the capacity of their 10-in. Circular Saw.

This is accomplished by means of solid cast-iron table extensions which are easily mounted on the standard heavily ribbed cast-iron table. With the new solid table extensions, 22 in. are added to the right of the blade, making a smooth working surface of over 33 in. With right-hand extension arms added to the solid extension, over 48½ in. are available for ripping operations. An ad-

(Continued on page 56A)

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SHOP EQUIPMENT NEWS

(Continued from page 54A)

Circular Saw with Increased Capacity

justable post gives rigid support for the extension table.

Also designed for use on the J-125 10-in. circular saw are solid extensions 11 in. wide for right and left of saw blade.

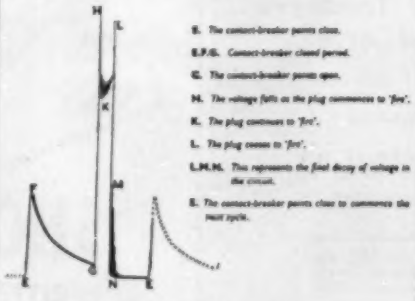
These new features combined with the basic machine make this a very powerful 10-in. saw. Other outstanding features are the design which permits the choice of 1½ to 3-h.p. standard NEMA motors, fully protected controls, precise adjustments, and special safety saw guard.

Further information is available.

(For Convenience Circle Index Code 0812)

NEW "ANAL-O-SCOPE" ELECTRONIC ENGINE ANALYZER

Snap-On Tools Corporation are introducing a New Electronic Engine Analyzer called the "Anal-O-Scope" which provides a visual picture of the complete ignition system of an engine. Either battery or magneto operated systems may be tested, showing the complete ignition cycle in the exact sequence in which it occurs.


H
L
K
M
E
G
N
F
E. The contact-breaker points close.
E.F.G. Contact-breaker closed period.
G. The contact-breaker points open.
H. The voltage falls as the plug commences to "fire".
K. The plug continues to "fire".
L. The plug ceases to "fire".
L.M.N. This represents the final decay of voltage in the circuit.
E. The contact-breaker points close to commence the next cycle.
NORMAL SINGLE CYL. TRACE

New "Anal-O-Scope" Electronic Engine Analyzer

— Photograph by Photographic Dept., Snap-On Tools Corp.

The "Anal-O-Scope" may be operated by 110-volt current or off the car battery. No power pack is needed. Handling 6, 12, or 24-volt systems, this unit shows the complete firing cycle of any single cylinder, all 4, 6, or 8 at once, or parades one after the other.

Using an entirely new method for testing engine ignition systems, the "Anal-O-Scope" enables the electrical performance of the entire circuit to be observed while the engine is running. The natural working conditions are taken into account and the effects of

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compression, temperature, and carburetion can be observed. Incorporating a cathode-ray tube which is the only electronic method of obtaining a visual trace or image of the complete ignition cycle, definite or intermittent faults are clearly shown by characteristic changes in the image shape.

This "Anal-O-Scope" is lightweight, portable, and comes complete with a power timing light and a full set of spark plug adaptors. This analyzer will be available approximately November 1, 1957.

More complete information is available.

(For Convenience Circle Index Code 0813)

CARBIDE HARDUTY DRILLS

Chicago-Latrobe have made available their new Carbide Harduty Drills which are designed and engineered for drilling hardened steels, 40 to 65 Rockwell C. Industry has found these drills to be conomically used in hardened die steel without annealing, reworking, and rehardening the parts machined, and in most cases eliminate reaming.

Carbide Harduty Drill

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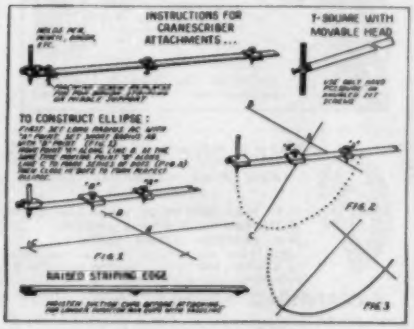
(For Convenience Circle Index Code 0814)

THE CRANESCRIBER FOR ELLIPTICAL DRAWING

The Fairgate Rule Company, Inc., presents a new item to be used for many purposes, but especially for elliptical drawing, called the Cranescriber. This has a set screw arrangement to move blade along radius for



The Cranescriber

a perfect ellipse. It can be used to transcribe an arc of any dimension up to 36 in., or it will draw a 36-in. circle. It may also be used as a movable T square.

Further information is available.

(For Convenience Circle Index Code 0815)

EXTRA HEAVY DUTY DRILL WITH 4-POSITION HANDLE

Portable Electric Tools, Inc., is featuring a new Extra Heavy Duty 1/2-in. drill with adjustable, or removable, 4-position rear handle.

The drill, with speed and torque requirements for continuous industrial use, is much easier to use in tight spots with the new handle.

The Portable Electric Drill is built throughout for rugged, nonstop use. The armature has two ball bearings and the spindle has ball and needle bearings. The motor pulls a full 5 amps.

Gears are precision cut from stressproof alloy steel that is strain-relieved and heat-treated before machining.

In addition, the drill is equipped with gear-type chuck and key, 10 foot rubber covered three-wire cord with molded strain relief, plug and adapter.

For further information write to the manufacturer.

(For Convenience Circle Index Code 0816)

DRY PROCESS WHITEPRINT OFFICE COPIER

Peck & Harvey Manufacturing Corporation have developed a completely new, high volume 26-inch width capacity fully automatic dry process whiteprinter.

P & H Arrow Whiteprinter

The P & H Arrow is designed to meet today's ever growing reproduction needs, and will print practically all letters, office forms and charts to 24 by 36 in. The productive capacity is equal to a dozen desk top whiteprinters. An Arrow can also replace two or three volume-type office diazo copying machines. It operates at speeds up to 75 feet per minute (100 watts per inch of light), with full development at all speeds.

Size: 60 in. high, 50 in. wide, 42 in. deep, plus rear delivery. Operates on 230 volt 60 cycle single-phase a.c. Starts at 22 amps. Operates at 24 amps. Net weight 900 lb.

For complete information, write for Arrow Bulletin 57A1.

(For Convenience Circle Index Code 0817)

NEW ELECTRIC UNIT VENTILATOR

An electric unit ventilator especially designed for school classrooms has been introduced by American Air Filter Co. Inc. The new Herman Nelson Electric Unit uses an electric heating coil and combines all the advantages of Herman Nelson's famous draft/stop system of classroom cooling, heating, and ventilating, with the low-cost, rapid installation advantages of electric heating.

The new electric unit is expected to have an advantage in certain areas over other types of heating systems in cases of new construction because it will eliminate much expensive construction costs such as boilers, tunnels, stacks and pumps, as well as other building and maintenance costs.

Over forty years of research and experience in classroom unit ventilation supported the development of the new Electric Unit Ventilator. The unit has been tested extensively in

(Continued on next page)

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SHOP EQUIPMENT NEWS

(Continued from previous page)

Electric Unit Ventilator

varying climates on the West Coast, and has been found to consume only from 1.3 KWH to 30.0 KWH, depending on the heat load required to keep the individual classroom comfortable.

Further information may be obtained upon request.

(For Convenience Circle Index Code 0818)

"PARENT" ELECTRICAL BENCH NO. 72-60-408BLZ

Parent Metal Products, Inc., have announced the availability of their locker base electrical bench which is 72 in. long, 60 in. deep, and 32¾ in. high. The laminated edge grain maple top is 1¼ in. thick, furnished in two sections, each 30 in. deep. The all-steel wiring tunnel

"Parent" Electrical Bench
No. 72-60-408 BLZ

is 72 in. long, 7 1/16 in. high, 6 in. deep, and equipped with eight duplex receptacles (four receptacles on each side). The base consists of four locker units, a center unit of four box lockers (two back-to-back), and two units of box lockers (one at either end), making a total of eight box lockers; and two tubular steel legs (one at either end) with flush-fitting protective shoes.

The locker size is 12 in. wide, 21 in. deep, and 15 in. high. Doors are equipped with spring hinges and padlock attachments.

A complete Industrial Arts and Vocational Shop Equipment Catalog is available by writing for a copy.

(For Convenience Circle Index Code 0819)

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One out of four accidental injuries to farm people results from falls. — *National Safety Council.*

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READER'S SERVICE SECTION

INDEX TO SHOP EQUIPMENT

The index and digest of advertisements below are provided for your convenience in requesting free product information, catalogs and literature offered by the advertisers and the manufacturers listed in Shop Equipment News. To obtain this information or literature, encircle code numbers, sign the card, and mail. Your request will receive prompt attention.

Code No.		Page No.
100	**Adjustable Clamp Company**..... Jorgenson and Peny clamps.	18A
101	**Allied Radio Corp., The**..... Free 1958 electronics catalog.	47A
102	**Aluminum Co. of America**..... Educational aids. Use coupon page 53A for catalog.	53A
103	**Alvin & Company**..... 1957 catalog drafting materials.	45A
104	**American Gas Furnace Co.**..... Heat treating equipment.	58A
105	**American Technical Society**..... Publishers.	46A
106	**Armstrong Bros. Tool Co.**..... Set-up and hold-down tools.	12A
107	**Atlas Press Company, The**...28A & Clausing 4800 Series Lathes.	29A
108	**Bedford Lumber Co.**..... Knockdown cedar chest and aromatic red cedar lumber.	54A
109	**Berger Scientific Supplies Corp.**..... All-in-one drafting kits.	42A
1010	**Bergling, V. C.**..... Handbook on designing, engraving and jewelry making.	56A
1011	**Black and Decker Mfg. Co.**..... Power-built bench grinders.	5A
1012	**Board of Examiners**..... Teaching positions.	58A
1013	**Brodhead-Garratt Company**..... Lumber contest. Use coupon page 37A.	37A
1014	**Bruce Publishing Company**.....3rd cover Texts.	
1015	**Buggie, Inc., H. H.**..... Radio instructional panel.	35A
1016	**Can-Pro Corporation**..... Shop aprons.	16A
1017	**Castolite Co., The**..... Fiberglas and liquid plastics.	39A
1018	**Challenge Machinery Co.**..... Safety engineered printing equipment.	13A
1019	**Chandler & Price Co.**..... Presses and paper cutters.	30A
1020	**Chilton Company**..... Builder's hardware handbook.	52A
1021	**Cincinnati Milling Machine Co.**..... Milling and grinding machines.	25A
1022	**Cincinnati Tool Company, The**..... Complete line of tested tools.	46A
1023	**Columbian Vise & Mfg. Co.**..... Woodworkers vise.	15A
1024	**Constantine & Son, Inc., Albert**.... Contest for craftsmen. Use coupon 58A for details.	58A
1025	**Cope Plastics, D. W.**..... New enlarged plastics catalog.	55A
1026	**Copper Shop, The**..... Enamel on copper idea book.	56A
1027	**Craftsman Wood Service Co.**..... New catalog wood and woodworking equipment.	53A
1028	**Crow Electri-Craft Corp. Div. Universal Scientific Corp.**..... Electricity and electronics for every school.	23A
1029	**Dake Corporation**..... Hydraulic presses.	8A
1030	**Delmar Publishers**..... Announcing Basic Science.	52A
1031	**Delta Power Tool Div. Rockwell Mfg. Co.**..... 11" metal lathe. Use coupon for details.	19A
1032	**Designers Company**..... Castings for school projects.	58A
1033	**Dietzgen Company, Eugene**...2nd cover Drafting, surveying and printmaking supplies.	
1034	**DonJer Products**..... Free catalog on pre-tested new ideas for school shops.	54A
1035	**Douglas Fir Plywood Assn.**..... Fir plywood.	43A
1036	**Duro Metal Products Co.**..... Power tools.	18A
1937	**Eastman Kodak Co.**..... Pajeant projectors.	20A
1038	**Electric Hotpack Company, Inc.**..... Plastic pre-heating equipment. Electric portable oven.	46A
1039	**Foley Lumber Company, T. A.**..... Lumber. New free catalog.	47A
1040	**Foley Manufacturing Co.**..... Saw filers. Use coupon for information and trial offer.	12A
1041	**Ford Motor Company**..... 1958 I.A.A. program.	50A
1942	**Formit**..... Tools and materials for making hand wrought iron work.	55A
1043	**Gaston Finishes**..... Wood finishes and supplies.	58A
1044	**General Finishes Sales & Service Co.** Wood finishing with Sealacell process.	54A
1045	**Gilbert & Miller, Inc.**..... Ideas for project activities.	56A
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1048	**Greenlee Tool Co.**..... Boring and routing tools.	26A
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1051	**Hardwood Corp. of America**..... School shop lumber.	34A
1052	**Hays Hardwood Lumber Co.**..... Domestic and foreign shop and furniture lumber.	56A
1053	**Higgins Ink Co., Inc.**..... Inks.	42A
1054	**Hossfeld Manufacturing Co.**..... Universal iron bender.	6A
1055	**Indianhead Archery & Mfg. Co.**..... Archery and leather kits. Send 10¢ for catalog.	58A
1056	**Irwin Auger Bit Co.**..... Wood-boring tools.	6A
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1058	**Kalamazoo Tank & Silo Co.**..... Metal cutting band saw.	16A
1059	**Kassel & Co., L. H.**..... Lamp parts and electrical supplies.	54A
1060	**Kester Solder Company**..... Flux core solder.	57A
1061	**Larson Co., J. C.**..... Free illustrated leathercraft catalog.	50A
1062	**LeBlond Machine Tool Co., R. K.** ..... Complete line of lathes.	4th cover
1063	**Logan Engineering Company**..... Lathes.	40A
1064	**Lufkin Rule Company, The**..... Precision tools.	24A

(Index continued on next page)

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INDUSTRIAL ARTS AND VOCATIONAL EDUCATION October, 1957
400 North Broadway, Milwaukee 1, Wisconsin

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NEWS OF PRODUCTS FOR THE SCHOOLS

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0802	0804	0806	0808	0810	0812	0814	0816	0818	0820	0822	0824								

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1065	**L-W Chuck Company** Dividing heads.	36A
1066	**Machine Shop Project Service** Complete learn by doing kits.	58A
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1083	**Peck, Stow & Wilcox Co.** New fact-packed school shop manual.	31A
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1093	**Saxcrafts, Div. of Sax Brothers, Inc.** Craft supplies. Free catalog.	54A
1094	**School Products Co.** Light weight shop coats.	58A
1095	**Schweizer Aircraft Corp.** Aluminum construction kits. Use coupon page 49A for easy ordering.	49A
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1097	**Sheldon Machine Co., Inc.** Variable speed precision lathes.	10A
1098	**Simonds Saw & Steel Co.** Si-clone saws.	26A
1099	**Snap-on Tools Corporation** Complete line hand and bench tools.	12A
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10116	**Wisconsin Laboratories, Inc.** Protexem paint brush care.	50A
10117	**Yates American Machine Co.** J-180 surfacer.	44A

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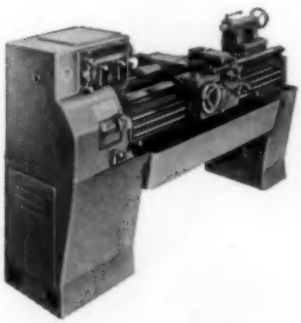

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